RAILROAD GAZETTE

FRIDAY, JULY 13.

Contributions.

A Diagram for Train Dispatchers.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Occasionally we read of a train accident caused by a train dispatcher giving wrong orders. A collision with such a cause is invariably a terribly fatal one. It is indeed very rare that a train dispatcher is so forgetful, yet when we consider what his duties are and the method by which he keeps a record of the position of the trains, it is only wonderful that a dispatcher can get through a single week without bringing his trains into collision. If there are no trains upon the road except those laid down in the time-table, and the trains are all on time, then his duties are light, because every movement of each train is executed according to the time-table, which has been carefully planned and distinctly printed. But when trains are behind time; when every freight runs in two or three sections, and there are half a dozen extra passenger trains to carry excursionists to some celebration or camp meeting, then must the dispatcher be upon the alert and concentrate all his faculties on his work. At such a time a clear head, a retentive memory and an active brain are absolutely necessary for the man who controls the movements of the various trains. As he orders one train ahead to a new meeting point, and directs others to await the arrival of some extra trains, he is playing a game of chess in which the trains are the pieces, and a false move will result in the destruction of thousands of dollars worth of property and place hundreds of human lives in peril.

How does he keep the position of the trains in mind? Ordinarily, the dispatcher has a sheet of paper before him properly ruled and printed, the lines in one direction representing trains, and those in the other direction representing stations. Upon this sheet he enters figures in their proper place, showing the time at which each train leaves a station, the time being reported by the various station agents by telegraph. Whether the trains are approaching dangerously near each other or a hundred miles apart, he only sets down figures in the proper column. Interpreting this time schedule we find, for instance, that the fast express passenger train No. 1 has just left Smithville station and is now dashing along with its seven heavily loaded coaches at a 40-mile rate toward Jonesville. Also that the gravel train has just got on to the Jonesville siding, while No. 2, the "Cannon-ball," is rushing headlong toward No. 1. All this and much more is indicated by the little figures on the schedule.

Is that simple record enough? Would it not be wise to amplify the record in such a way that the situation can be comprenended at a glance? To this end I propose a diagram, such that the dispatcher can graphically represent the position of every train. Take a blackboard, long and narrow, and divide it crosswise into spaces to indicate the stations consecutively. Have a strip of brass inserted edgewise into the face of the blackboard, and standing out, say, half an inch from it. This brass strip represents the main track. If the road has a double track, use two parallel strips to indicate the two tracks. At every station where there is a siding insert an additional short strip to represent the siding. Now, for trains, have some little blocks of wood, say an inch long, half an inch high, and a quarter of an inch thick, pointed at one end, with a slit along one edge so that they can be placed upon the brass strip anywhere. Have as many blocks as there are trains upon the time-table, with a surplus to represent the occasional extra trains or sections. The blocks should be numbered to correspond with the train numbers in the schedule. It would be well to have the blocks painted different colors. For instance, red blocks for west-bound or odd-numbered trains, and green blocks for east-bound even-numbered trains. A blue block could be used for a work train, and a yellow one might represent the pay-car or some other official special.

To use the apparatus, as soon as a train starts from its terminal station, the dispatcher selects from the heap the block whose number corresponds to the number of the train, and places it upon the strip of brass just beyond the station it has left and pointed toward the next station. As each train is reported leaving a station he shifts its representative block along past that station, besides recording on the the schedule sheet the time of leaving, just as he would do without the blackboard. As time goes on a glance at the diagram shows him that red No. 1 is approaching blue No. 8, and that blue No. 3 is but little behind blue No. 16. Every train on the road is there before him in its proper relative position, and whenever the symbolical blocks are grouped together, there is the place and those are the trains that require his closest attention. This diagram will serve as a check upon the schedule sheet and constantly interprets it. The mere writing off figures in their appropriate columns become almost mechanical, and does not impress the mind as an act of much consequence; but as the blocks are moved upon the board the changes of position appeal to the senses at once, and a dangerous proximity of trains is manifested immediately by the position of the wooden dummies.

Before issuing a train order the dispatcher can shift the position of the blocks representing the trains that would be affected, and thus see what would be the result of issuing the proposed order, and can readily ascertain the easiest and safest way of passing the various trains by one another, and then issue such orders as will be necessary to carry out the plan. By so doing he will be less likely to forget any irregular train.

As for details and dimensions of the proposed blackboard, suppose the division of road under control of the train dispatcher to be 200 miles long, with 40 stations. Our dummies were to be one inch long, and each station on the blackboard should have room enough for two trains, and the space between stations should be sufficient to contain three or four—that is, for each station and adjoining space we shall need six inches. It is not necessary to lay it off to scale, although it would be better so. Forty stations will require 240 in. or 20 ft. in length. It would be more convenient to take a board five or six feet long and divide it longitudinally into four parts, each part showing one-fourth of the number of stations. This would bring the board down to such dimensions that the despatcher could reach any part of it without rising from his seat.

The names of the stations should be painted on, together with such other notes as are deemed desirable. Telegraph stations, coaling or water stations, and turn-tables should be indicated in their proper places by words or symbols. Junctions or crossings where close connections are usually made, should also be represented. A separate board can be used for each branch. The apparatus can be easily and cheaply constructed at the car shop under the supervision of the train dispatcher. The dimensions can, of course, be varied to suit one's fancy or convenience, but the principle of graphically representing the position of the trains remains the same, and would seem to be of great use to a busy dispatcher.

T. APPLETON, C. E.

COUNCIL GROVE, Kan., July 5, 1883.

Fractures of Cast-Iron Car Wheels.

PHILADELPHIA, July 5, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Considering that *so much* has been said within the last three months about the breakage of cast-iron car wheels, and the consequent necessity of a standard test to protect railroad companies using them, is it not singular that it has all been said *within* the last three months?

Standard tests for axles, presumably made of a much stronger material than the wheels on them, have been used for years on the leading roads; yet it is only recently that they have been proposed for wheels, or that the frequent breaking of wheels has been a subject of remark. Even in comparisons with tired wheels, the question has been rather as to cost in relation to *wear* than strength.

The natural inference from this seems to be that until recently there has not been enough breakage of wheels in proportion to the number in use to atract attention. The publication of the reports of two prominent companies in New York appear to be the basis of the present interest in the subject; and it has been assumed in the absence of any others, that these represent the case throughout the country, and under all conditions.

Allow me to make a few statements on this point.

The tendency of all cast-wheel makers is to make wheels too soft, rather than too hard. It is easier and safer. One proof of this is, that while, as already said, no tests have been required as to strength, yet guarantees as to durability by mileage have been long required. Under this state of things, and while the weight was only two tons on a wheel, few wheels cracked. But the weight of cars and lading have been gradually increased, until the 20-ton cars, giving a total weight of four tons on a wheel, has come into general use within the last three years. The speed of trains, a very important element, has also been much increased. Meantime, although every other part of the car has been strengthened—although the Master Car-Builders' Association has fixed a standard size for axles which has carried their weight from 300 lbs. up to 370 lbs. (23 per cent. advance), the only change in the wheel has been, tentatively and individually, an increase of weight from 500 lbs. to 530 lbs. or 550 lbs. (7 to 10 per cent. advance). The responsibility for this omission lies between railroad companies, car-builders, and wheel-makers; but as the representatives of the former have taken the initiative in regard to axles, it would seem that they should do so in regard to wheels. And this, I understand, is what they now, though rather late, propose to do.

Meanwhile, it is not strange that wheels break whose only fault heretofore was that they wore out too soon,—and it is still less strange that those which had not even this fault, should break even faster.

The conclusion then would seem to be this: that good cast-iron wheels have been found to be strong enough for railroad service in the past; and they *have not been proved* to be too weak for it in the present. The average weight of wheels, no doubt, needs to be increased for the same quality of material, depth of chill, and form of pattern. How much that increase should be depends upon what improvements can be made in quality and form, and whether the hardness of tread shall be brought down to that of ordinary steel tires.

We Americans, with all our wastefulness, are often unexpectedly "near." While we hesitate to increase the weight of a cast wheel, worth say 2 cents a pound, to 550 lbs., we lean toward a wrought wheel still heavier and at a much higher price.

I think, however, that it would be an error on the part of railroad companies to fix a minimum weight, unless as a temporary measure. When they are sure of the quality of a wheel, they may rather find it advisable to fix a *maximum*, in order to protect themselves from useless weight. The weight (apart from this), the composition of metal and the form of pattern should be left to the maker, provided he furnish what the company requires as to durability and strength. When the company has fixed its standard quality of material that will give these (which it can do from its records and its wheel yards), it may require from its suppliers test pieces taken from the same cast with the wheels they send, whose strength and chill shall correspond with those standards. The remaining point, the strength of that material in a given form, can be determined by simple mechanical tests of a wheel. These will show which may be the best among a variety of patterns of equally good material.

One word as to the alleged average rate of fracture among American car wheels, which your recent articles would convey the impression is about 4 per cent. per annum.

The most complete recent returns that I have, being for the whole of the last two years, from one of the largest northern roads; using as large a proportion of heavy cars as any others, running at high speed, and having unusually heavy grades (where the use of the brake heats and cracks the wheel), are as follows:

Fractured wheels removed from cars and engines on Pennsylvania Railroad, viz.: main line, Philadelphia & Erie Railroad and United Railroads of New Jersey:

Year.	Cracked.	Broken.	Total.	No. of wheels on Jan. 1.*	Percentage. Cracked.	Brkn.	Total.
1881	2,034	454	2,488	353,496	0.57	0.13	0.70
1882	2,197	380	2.577	397,280	0.55	0.10	0.65

*See Poor's Manual, 1881, p. 260; 1882, p. 271.

As the accidents are caused by *broken* wheels, it is important to note the low percentage of these, which certainly compares well with that of English wheels run under much more favorable conditions.

If we allow that these wheels were exceptionally soft, yet they can hardly be less durable than steel tires, which cannot be harder on the surface than throughout. And if the steel tire can be turned, the chilled wheel can be ground to a new true circle, and used again.

It is, of course, not proper to make from a single road an average rate of fracture for a country where car wheel service is so diversified as ours, by climate, grades, speed, etc. but it is certainly safe to say that throughout the level and warm regions south and west of Pennsylvania to the Gulf and the Rocky Mountains, the rate is much less than those just quoted.

But the test of the *capability* of an article, after all, should not be made from the average product, but from the best. On this basis, the present indications seem to be, that under equal conditions, steel-tired or cast wheels, of equal rank in their manufacture, will give essentially equal results as to fracture.

J. S. W.

Train Rules.

X.

TO BRAKEMEN.

☞ *The word "Rear" is placed against those rules which are for the rear brakeman only, and the word "Forward" against those which are only for the brakemen at the forward end of the train.*

105. Your duties are to be performed under the direction of the conductor.

[106. Be on hand at beginning of each trip, etc.]

[107. Must not carelessly display red light.]

[108. Must notice red and green signals on other trains.]

[109. Responsible for switches turned.]

110. (*Rear.*) In the day-time you must keep bright red flags displayed on the rear car; one on each side, on or near the top, where it can best be seen from the engine of your train, and both of them where they can also be plainly seen by any one approaching from the rear.

111. (*Rear.*) At night you must keep red lights displayed on the rear car; one on or near the platform or buffer, and one on the roof or hung from the extreme end of the roof: both of these to be in plain sight to anybody approaching from behind; also one on each side where it can best be seen from the engine of your train.

112. (*Rear.*) You must keep in the day-time a red flag, and in the night a lighted red lantern, inside the rear car.

113. (*Rear.*) (*a*) Whenever, outside a station yard, your train, or any part of it stops; or whenever its speed is slackened so that you are likely to lose three minutes or more, you must *immediately* go back with a red signal to stop any train that may be following. (*b*) You must go at least half a mile unless a train is met nearer, and (*c*), if the view is short or there is a storm or fog, you must place two torpedoes on the rail, ten feet apart, both at least half a mile from your train. (*d*) If a train arrives, you must, after stopping, return to your own train. (*e*) If no train arrives, you must keep half a mile behind your train till called in by the whistle, or by an order from the conductor. (*f*) If you are called in before any train arrives you must leave two torpedoes fastened to the rail, unless you know your train is within a station yard. (*g*) If you find that your train is moving forward slowly, you must place a torpedo on the rail once every mile. (*h*) When left by your own train you must get on to the next following one and proceed to your own as soon as possible.

114. (*Forward.*) (*a*) Whenever your train obstructs a main track on which trains travel in the opposite direction, you must immediately go forward with a red signal to stop any approaching train. (*b*) You must go at least half a mile unless a train is met nearer, and (*c.*) if the view is short or there is a storm or fog you must place two torpedoes on the rail, ten feet apart, both at least half a mile from the obstruction. (*d.*) If a train arrives, you must, after stopping it, return to your own train. (*e*) If no train arrives you must stay at least half a mile from the obstruction till you are called in by the whistle or by an order from the conductor.

[115. When a first or second-class train is due, be a careful in yards as outside of them.]

116. Whenever you leave a car, you must see that it is secured by a brake, either on the car itself or on another, attached to it; and whenever you take *a portion* of a lot of cars from a turn-out or elsewhere, you must

see that those which you leave are properly secured. Where cars are left standing on a track that is not perfectly level, the brake must always be set on the lower car. The lower ones must not be regarded as safely secured merely by being attached to those above them.

PASSENGER BRAKEMEN.

117. WHEN EMPLOYED ON A PASSENGER TRAIN you are to be governed by rules 118 to 122 inclusive.

118. [Requires uniform.]

119. Passengers should not get on or off a car when it is in motion, not put their heads or arms out of car windows or stand on the platforms of cars, and whenever you see them doing these things you must caution them not to.

120. You must, as far as possible, see that passengers enter the car by the rear door and leave by the forward one.

121. You must be watchful of the comfort of passengers, particularly when they first get aboard the train, and assist them to find seats whenever they require assistance.

122. You must keep the temperature in the cars as near —— degrees above zero as possible.

It is, unfortunately, true that there are still left a few (?) roads that employ for freight brakemen, apparently, the lowest class that can be found; the ruling idea seeming to be that so long as the men do not appropriate *all* the cigars, oranges and other "desirable" kinds of merchandise they can lay their hands on, they will answer. Where this is the case the most important rule in connection with the brakemen's duties is, without doubt, that one in the conductor's department which requires *him* to be responsible for his men; and the strongest clause of this rule is the unwritten one which may be "read between the lines," requiring that the men be ruled with a rod of iron. But where intelligence is sought, and brakemen's positions are filled with men who are likely to be fit for promotion and who have some idea of responsibility, the plan of addressing each grade individually and directly has its advantages the same as in any other department. Where men cannot be made to read *any* rules, there may be some reason for talking to them through a superior officer; but even then, the simplest and most direct form is the best, so that to those who do not favor giving the brakeman his instructions direct, we have simply to recommend the placing of additional stress on the rule requiring the conductor to be responsible; the essential difference between their plan and this being in the signature. Here the superintendent's name is signed to the rules, and they simply substitute the conductor's.

The apparent objection that such a rule as No. 116 ought to be addressed to conductors as well as brakemen is met by the provision requiring every person to follow the rules of the department *in which he is working*, if, indeed, it is not wholly laid aside by the fact that all conductors have had experience as brakemen, and, inferentially, with brakemen's rules.

It is common to require more, *or less* tail signals on passenger trains than on freights, but as there is no essential difference in principle I can see no good reason why all trains should not be treated alike in this respect. On a train composed wholly of platform cars the "tail-end-man" might perhaps experience some slight difficulty in obeying the rule (110 and 111) as above, to the letter, but as no law requires impossibilities, and as there is nothing in the rule calculated to encourage carelessness, no harm could ensue. To enable the engineman to keep track of the rear car of his train seems to be the reason generally given for requiring more signals on a freight than on a passenger; but why shouldn't he be as careful with one as with the other?

There are unfortunately still many roads that invite rear collisions like that at Pittsburgh a few years ago by placing the tail light of passenger trains on the platform, where a single passenger can easily hide it without even knowing it; the hanging of a lantern from the roof ought therefore to be urged more persistently than it has been.

If the importance of accidents and of obviating them corresponds with their numerousness, Rule 113 is at the present day (or ought to be) the most important *preventive* rule in the whole code. But as its strength lies in its enforcement, we are not called upon here to assume the whole burden in the premises.

The clause in reference to going back when the train is losing time (but not stopped) is frequently omitted, but of course is necessary, though more discretion has to be allowed the brakeman than in case of total stoppage. The three minute clause might possibly encourage some lazy brakeman to wait three minutes after the train had come to a full stop, but any caution against this error would perhaps better be placed in a foot-note rather than included in the rule, where it would tend to weaken the force of the main statement. The fact that occasions when freight trains fail to make their running time are, in some localities, quite frequent, may, perhaps, be regarded as a difficulty in the way of the enforcement of this clause, but it certainly is not a valid reason for its omission. If conductors exercise a little forethought they can in many cases, probably a large majority, arrange to have station agents protect them over difficult pieces of road where they are likely to make poor time, thus keeping their brakemen with them, and at the same time retaining the benefits of the rule.

As before intimated, the writer does not assume to say that half a mile is the proper distance to send a flag; at all events, a rule specifying that as the limit ought always to be complemented by one on the engineman's page, requiring that *always and everywhere* the speed of trains be kept within such bounds that they can be readily stopped within the distance named.

In view of the bad effects resulting from the presence in a code of rules which are habitually disregarded, the subject covered by No. 119, perhaps, would best be omitted. So long as every American has fifty odd millions of his fellows, each armed with a copy of the Declaration of Independence, to back him up in his pursuit of (the enjoyment of) "life, liberty and happiness," it will be extremely difficult to keep passengers from riding on the platform, breaking their necks, etc.; so the posting of a printed warning on or in the cars is perhaps the only practicable way for a railroad company to do its duty in the premises.

An Organization for an Economic Management of Railroads.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Railroads, as a whole, have a poorer system and method of operation than almost any other business. Nor does any other branch of industry employ so many men of great mental capacity and superior ability. These seemingly contradictory facts are due to the heterogeneous character of the business, which employs nearly every profession in its operations; to its necessary magnitude; to its wide distribution, often scattered through several states, and largely to the ignorance of the mass of railroad owners and the ambition of railroad managers. The mass of stockholders are merely investors, who know nothing of the principles upon which railroad business is conducted, and who pride themselves upon being stockholders in proportion to the magnitude and power of their company. To foster this desire after immense institutions, men who have taken front rank in the railroad world seek to extend their control over large systems, thus obtaining for themselves large incomes and greater influence. This effort after personal power is perfectly natural, but no intelligent railroad manager, can fail to recognize that while great opportunities are opened to him by the increase of what is, doubtless, an already giant railroad system, the stockholders' income must in time become less. Beyond a certain point, not easily determined, the increase of a railroad's mileage decreases its proportionate returns. It is, then, of the first importance to stockholders to know something of how railroad property may be managed to produce the best monetary results. The present *top-heavy* condition of several of our largest railroad systems urges the speedy and careful consideration of this subject.

Whatever may be the experience of political governments, it certainly is the experience of great monetary enterprises that "the one-man power" is essentially the most efficient and economical. Division of power means confusion, and no monetary interest can be managed to the satisfaction of its stockholders by a board of persons, unless that board delegates one individual to act in the full capacity of *head*. What is everybody's business becomes nobody's business. It is to be considered, however, that railroad systems have grown, in this day, to such gigantic proportions that no single man can intelligently and economically manage the affairs of one of the larger of them. Attempts have therefore been made by railroad presidents and boards of directors to divide the management into departments, with a man at the head of each to look after the affairs of a certain character for the whole system. This attempt is daily proving a failure.

On a system, say of five thousand miles, the officer at the head of a single department is unable to see and comprehend the affairs of his own department in that detail which enables him to have everything move along without jar or discord. Being thus so over-engaged in the matters of his own department, he fails to recognize the proper relations of the work under his own charge to that of other departments of the road. Over the whole road is a President, or General Manager to whom he reports, and who is supposed to watch that the interests of the company's business are forwarded by all departments. But if the department head is unable to clearly discern the movements of his own department, how much more in the dark must be the General Manager, whose chief source of information he is.

It is claimed for our vast railroad systems that they secure economy in cost of management per mile of road. In part, this is doubtless true; but while they save a penny in the cost of salaries, etc., they are losing dollars in the inability of the management to watch every crook and turn of the business. The loose ends of a great system are surprisingly many, and but few of them are ever gathered up. The gain, from true arrangements of traffic and the monopoly secured in certain sections of the country by a large system are more real. But cannot these advantages be secured by other means.

I do not think over five hundred miles of railroad, doing a fair business, can be economically managed by one set of men. Roads over-reaching this mileage to any great extent become too much for any manager and his staff to get the largest profit out of them. A co-operative policy may be established between a number of roads of modest pretensions, and all the advantages of through traffic arrangements and maintained rates of tariff secured. The same company, indeed, may own any number of roads of moderate mileage, each to be independently worked under the direction of a single individual as "manager." The company owning these roads could, through the company officers, adopt such rules and regulations to be carried out by each manager on the road intrusted to his charge as to secure uniformity and co-operation of the entire property of the company. All the advantages of our largest railroad systems would thus be secured and the economies of the smaller roads retained. Monthly, semi-annually or annually the manager of each road can return the net earnings, with a full statement of operations, to the owners. The general officers of the company, elected from among the stockholders, should be:

1. President.
2. Vice-President.
3. Secretary.
4. Treasurer.
5. Counsel.
6. Chief Engineer.
7. Mechanical Engineer.

The last three may be employed by the company, outside of members of the corporation. But it should be clearly understood that whatever policy or plan may be adopted by the owners or the officers of the company, its execution on any road must be entirely through the "Manager" of that road. And since the company must look to the Manager for the profitable operation of the road under his charge, it should be very careful not to hamper him with unnecessary restrictions. Five hundred miles of railroad, in the northeastern portion of the United States, might do the business and require nearly the force employed by a thousand miles elsewhere in this country. But should this be the entire railroad property of the company owning it, it might still be deemed expedient to place it but under one *Manager*. Under these conditions, the organization required, under the one man principle, would be something as shown by the following table, viz:

- General Manager.
  - 1. Comptroller. (In charge of the offices.)
    - 1. Cashier.
    - 2. Bookkeper or Auditor.
    - 3. Supply Clerk or Purch. Ag't.
  - 2. Traffic Manager. (In charge of the traffic business.)
    - 1. General Freight Agent.
    - 2. General Passenger Agent.
    - 3. General Baggage Agent.
    - 4. Local Agents.
  - 3. General Superintendent. (In charge of line and roadway.)
    - 1. Master of Transportation.
    - 2. Master Mechanic.
    - 3. Road-Master.
    - 4. Supt. of Bridges and Buildings.
    - 5. Supt. of Telegraph line.

Or the business of the road might not be sufficient to justify the expense of such officers as the Comptroller, Traffic Manager and General Superintendent. In such a case, the Manager could dispense with these intermediate assistants and act in their places, under the organization shown below:

- Manager.....
  - *Office.*
    - 1. Cashier.
    - 2. Bookkeeper.
    - 3. Supply Clerk.
  - *Traffic.*
    - 1. General Freight Agent.
    - 2. General Passenger Agent.
    - 3. General Baggage Agent.
    - 4. Local Agents.
  - *Road.*
    - 1. Master of Transportation.
    - 2. Master Mechanic.
    - 3. Road-Master.
    - 4. Supt. of Bridges and Buildings.
    - 5. Supt. of Telegraph Line.

Under the latter arrangement, the Manager might find himself confined so closely to the headquarters of the road that it would still become advisable to resort to the expense of a competent Assistant Manager, or General Superintendent, to look more particularly after the interests of the company out on the road. But I cannot but believe that any company owning five hundred miles of road, more or less, the business of which required such a staff of officers, when managed as a whole, would find it decided economy to divide the property into two distinct parts and place each under an independent management. A competent railroad manager would be able to know the principal doings and direct the principal affairs on a line of 250 miles. He could moreover, secure a harmony, uniformity and consistency among the various transactions of the company's servants in their dealings with each other and with the public, which is impossible in a business which is too great for the immediate supervision of one man. The only organization, needed for a road of 200 miles or so would be as follows, viz.:

- Manager.....
  1. Comptroller.
  2. Superintendent.
  3. General Freight Agent.
  4. General Passenger Agent.
  5. Local Agents.

If the two hundred and some miles were the only property of the company, the "President" should act as "Manager" and the "Treasurer" be the Comptroller of the company, and the organization be:

- President.....
  1. Treasurer.
  2. Superintendent.
  3. General Freight Agent.
  4. General Passenger Agent.
  5. Local Agents.

I believe it very desirable that the local agents, as well as the general agents, should be appointed and removed directly by the Manager. Those who must have such important responsibilities as devolve upon this class of railroad employès should report to and be in immediate communication with the chief officer. The general agents may well be consulted in all cases of appointments or removals, and under the advice of the Manager give the required instructions to local agents respecting the rates, classification and methods of conducting the freight and passenger traffic A much needed reform on some roads, now in operation, especially in the south, is the separation of the traffic from the transportation business along the line. These two branches of railroading require very different kinds of talents, and to attempt to make the agents the local managers of both is neither safe nor economical. The local agent should be a thoroughly commercial man and have charge of selling tickets, collecting moneys on freight and paying claims authorized by the manager. He should give needed information to passengers, attend to their comfort, receive and deliver freight, look after the claims of the patrons of

he road, and secure business for his line by all right means at his command. The further duties resulting from the the character of the business will require him to load and unload freight to and from the cars of the company, forward "way bills" of same to the agent of the station to which it is consigned, and furnish conductors (or station master) with proper "slip bills." At the junctional points the agent will be required to interchange business with connecting roads. In fact, the local agent should represent his company at his station in all its dealings with other companies, with customers of the road and with the public. To accomplish all these duties at an important town a corps of assistants will be required, as follows:

Local Agent.....
- *Freight.*
  1. Cashier.
  2. Contracting Clerk (Rate Clerk).
  3. Bill Clerk.
  4. Entry Clerk.
  5. Transfer Clerk.
  6. Receiving Clerks.
  7. Delivery Clerks.
  8. Laborers.
- *Passenger.*
  1. Ticket Clerks.
  2. Baggage-men.
  3. Porters.

The Transportation Department should furnish agents the proper cars, at their request, and prescribe the manner in which they should be loaded to insure safe and economical carriage. This department is at the call of the agent, at a junctional point, to accomplish the interchange of cars required by the through traffic arrangements. At such points and at large towns, termini, etc., this work will, of course, be performed under the direction of a station-master (or train-master) and assistants; but at small stations along the line, the necessary work of moving cars, putting them into and setting them out of a train, will be done by the conductors. The station-master is the local representative of the transportation department. He must inform himself of the capacity of the motive power furnished and make up trains that can be readily hauled. He should arrange the cars in trains in the proper order for ready distribution, at stations to which they are consigned. He should be charged with seeing that conductors, engine men and trainmen report for duty at the proper time, and that trains leave as per schedule. He should receive all train papers from conductors of incoming trains, and relieve them from duty immediately on their arrival at the terminal station. He must move cars as required by the agent in the furtherance of the company's business, and see that all trains are moved safely through the yards in his charge. He must watch the property of the company and see that it is protected from theft and fire.

The movements of trains upon the road should be provided for as far as possible by time card, and the telegraph used only as a last resort. The rules governing the movements of trains should be as simple as possible, and no more in number than will cover the necessities of the business. The more the rules the more the danger that conductor and trainmen will forget, or neglect to act in accordance with them. (See the *Railroad Gazette* of May 18, 1883, for some very valuable suggestions in regard to train rules.)

To provide for contingencies, a Train Dispatcher located at the o ce of the Master of Transportation, should keep informed of the whereabouts of all trains, and from this information give any necessary orders to conductors and enginemen which shall enable trains to proceed safely and without loss of time. To enable train dispatchers to do this, operators must be located at important stations, who shall report to him the arrival and departure of every train, and who shall deliver to conductors and enginemen such train orders as they receive from him. The organization of such a Transportation Department would be as follows:

Master of Transportation.
1. Train Dispatcher.
2. Car Accountant.
3. Station Masters.
   1. Clerk.
   2. Yardmen.
   3. Switchmen.
   4. Gatemen.
4. Conductors.....
   1. Baggagemen.
   2. Brakemen.
   3. Porters.
5. Operators (Telegraph).

It is the duty of *Mechanical or Rolling Stock Department* to furnish the required engines and cars in good repair, clean, and adapted to the work to be performed. To be able to do this properly the Mechanical Department requires shops equipped with the most approved machinery and a superior force of artisans. This department also requires skilled inspectors to examine all engines and cars as they arrive at their stations, and make any needed repairs which do not require shop work. Inspectors should have passenger coaches kept properly cleaned, and should promptly send any car or engine to the shops when not fit for use.

The Mechanical Department should furnish an engineman and fireman with each locomotive in use. The engineman, when running, must follow the directions and perform such duties with his engine as the Transportation Department requires. Fuel and water should be supplied locomotives from stations erected for this purpose, in charge of pumpers and fuel keepers. The following organization will be effective:

Master Mechanic...
1. Overseers of shops...
   1. Machinists.
   2. Blacksmiths.
   3. Carpenters.
   4. Molders.
   5. Painters.
   6. and other Artisans.
2. Inspectors.
   1. Repairers.
   2. Cleaners.
3. Enginemen..
   1. Firemen.
4. Pumpers.
5. Fuel Keepers

The Maintenance of Way Department is charged with the keeping of the track and everything pertaining to it in such a state of perfection as to enable the trains of the company to carry the traffic of the road over it economically and quickly. On some roads the repairs and renewals of bridges, buildings and telegraph line are made a part of the "maintenance of way" department work. This will do when the head of the department is a competent civil engineer, but generally proves a very expensive and unsatisfactory arrangement. Road-masters have generally, greatly to their honor, risen from the rank of section-men. They know all about track work, but are ignorant builders and mechanics. On the other hand, an intelligent and energetic artisan at work on bridges or buildings, becomes thoroughly conversant with the most efficient and economical means of erecting or keeping them in repair, but knows nothing of track work. The erection and renewal of the telegraph line, though a smaller task, requires nearly as distinctive talent and experience. Therefore I believe it wise that the maintenance of the company's permanent property be separated into three departments, with an organization shown below:

Road-Master.
1. Supervisors. } Section-men. Watchmen.
2. Foremen of Extra Gangs.
3. Conductors of Construction trains. } Brakemen. Laborers.

Foreman Bridges and Buildings.
1. Carpenters.
2. Blacksmiths.
3. Bridge Mechanics.
4. Painters.

Foreman Telegraph line.
1. Line Repairers.
2. Climbers.
3. Laborers.

I think it will be found economy to have supervisors in charge of sections, in place of section foremen. No great amount of intellect or reliability can be secured for the usual section foremen's salary of $45 per month; yet more cannot well be paid on a section of four to seven miles. Let the section be twice as long and a superior foreman or supervisor at $75 per month placed in charge, and better work will be obtained. When it is required to work his gang in two parts, let the supervisor place his best man in charge of the portion doing the easiest or least important work.

A considerable *office* force, will of necessity be required to look after the incomes and disbursements of the road. This clerical force, under the charge of a "comptroller" or "treasurer," will be required to audit all returns from agents and conductors of the traffic carried, and to so classify the income and disbursement as to give an adequate understanding of the cost of each kind of traffic, with the resulting profit or loss.

One criticism only will I make here upon the usual order of things in the office department. The elegantly furnished pay car, the special pay train, the waiting employés, the diamond-studded Paymaster, with his bodyguard of clerks and porters, and all the paraphernalia of the pay service, seems to me as needless an expense as it certainly is a large one. Let the pay rolls, when audited and approved, be sent to the agents best located for the purpose and paid by them. Or pay by tickets, through the heads of the departments, and let the tickets be cashed by *any agent of the road.*

I believe an organization, such as I have shown above, for a road of two to five hundred miles, will secure the largest returns on the capital invested. And, as I have endeavored to show, any company owning a large number of such roads, properly located in reference to each other, could establish such co-operative interchange of business between them as to secure a far larger return upon their capital than if all the roads consisted of one giant system under one management. I deem such an organization equally desirable to the public, and hope to see the future ambitions of railroad officials turned more toward the perfecting of their business and less toward their own personal aggrandizement. I am of the opinion that should they not do so from choice, the generally increasing intelligence of capital will eventually compel them to that course of action.

American Locomotives in Australia.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Having no doubt but that you have long ere this heard of the very warm reception that American locomotives have met in this country, and knowing you would like some particulars of the attendant circumstances from one who would be able to give you an unprejudiced account, I take the liberty of an old reader to drop you these few facts.

The warmth of the reception may be appreciated, since the heat was so great that they managed to melt a set of furnace bars. Certainly a grate event!

As you may not be aware of the reason that these engines were imported, I very briefly explain. Some considerable time since a commission was appointed to inquire into the efficiency and economy of the railroads of the colony, and a very eminent engineer, the late Mr. Higginbothom, was invited to inspect them and report. Among other recommendations he advised the introduction of American engines, to reduce train mileage. At about this time there was a very heavy section of railroad under construction, and the Engineer in Chief ordered four locomotives from the Baldwin Company, under certain specification and guarantee to work this line. Passenger engines to be capable of hauling 120 tons at 30 miles per hour, up rising grades of 1 in 45 (115 ft. to the mile). It would seem that in ordering these engines the Engineer had not consulted a subordinate officer who had charge of the locomotive department, and who, to use his own words, "looked into the matter very closely some years ago (he is still a young man), and I then came to the conclusion that there was nothing in American engines that would induce me to set aside English engines in their favor," and "If they turn out unsuccessful, I think it right to say the locomotive department cannot be held responsible for them." Seeing the Engineer-in-Chief was absent during the first public trial, they managed very well to raise a fine dust about the engines by their arrangements.

March 14 was to be a great day, as the first section of the Hills Railroad was to be opened for traffic, and some 200 guests were invited to a square feed at the end of an anticipated pleasant journey. A train of cars of about 90 tons was prepared, and a start made in fine style; but before reaching the tenth mile—who would dream of such an event?—they stuck for want of steam. They then found that they had melted a set of grate bars, and only reached their destination, 22 miles, by assistance of another engine, about 4 o'clock p. m., thus doing the 22 miles in a few minutes under five hours.

It would amuse you to see some of the letters that actually flooded the daily papers for some days about these engines and their failure. But when I tell you that five men were on the foot-plate, and every one prejudiced against the engines before starting, the runner taking his cue from his superior officers, no one could doubt the result. This same engine had worked successfully for six weeks, in charge of a man of different stamp, and on a very heavy road.

Then he, forsooth, had written to a daily paper stating that he had exercised his whole judgment and ability, but, as some other correspondent pertly remarked, his must indeed be a limited supply. As these engines now are doing good work on the same line, I have no doubt but they will settle down to it soon, and no more be heard about it.

Inclosed find some cuttings you may not have seen.

The engine referred to in letter by "Citizen" is a consolidation, 20×24 in.; wheel, 48 in.; tractive force per pound of steam, 200. The largest English engine is 16½×20; wheel, 48; tractive force per pound of steam, 113.

These engines are working on the same road under nearly the same conditions, and are therefore a very fair comparison. At some future period I may give some particulars of their behavior. A COMPATRIOT.

[The following are selections from some Australian newspapers sent by this correspondent.]

From a report by Hon. J. W. Downer, J. G. Ramsay and J. L. Parsons, members of the government, on accidents on the Nairne Railway, where this "trial" was made.

"Having taken evidence and fully considered all questions that have arisen with respect to the Nairne Railway and its management, we find:

"1. *General Management.*—Since the month of November, 1879, the railway department has been managed by three independent heads—the Engineer-in-Chief, the General Traffic Manager, and the Locomotive Engineer; and though these gentlemen have not acted in any antagonism to each other, we think it very expedient that they should confer together to a greater extent than they have hitherto done on all matters connected with their various departments, with a view to general efficiency. In the future we would recommend that nothing concerning any of the departments relating to railways shall be initiated, nor any alterations made, without the heads of the three departments meeting together and reporting their agreement or disagreement to the Commissioner of Public Works, who shall thereupon decide what is to be done. We think it also necessary that the heads of the three departments should meet together weekly to confer as to the working of their several departments, and that they should, after each meeting, report to the Commissioner the results of their conference.

"2. *Efficiency of the English and American Engines.*—The evidence we have taken satisfies us that both for economy and utility the English are superior to the American engines, and we think it is expedient, so soon as the water supply will enable it to be done, that the English should be used on the Nairne Line in preference to American engines.

"3. *Condition of the Line.*—We are satisfied that the Nairne Railway line is as good as any railway line in South Australia, and that trains can be run upon it with perfect safety, the various accidents that have happened being in no way treaceable to any imperfection in the construction of the line, but solely to the reasons we will refer to hereafter.

"4. *Stoppage on the Opening of the Line.*—The breaking of a set of fire-bars was the immediate cause of the stoppage, but we think that the American engine was not capable of taking the train of the 14th of March to Aldgate at the passenger train rate of speed, and that the Locomotive Engineer should have known of this. It appears from his own evidence that he was doubtful of the hauling power of the engine, and that even at starting he did not think the train could be taken to Aldgate according to time-table. On the trial trip on the 8th of March, Mr. Thow formed no very high opinion of the engine, and the engine-driver thought that the engine could not be safely expected, at the rate it was traveling, to draw a greater load than was then taken on that day. In spite of this the engine on the day of the opening was driven with a load 17 tons heavier, and at a greater pace between Adelaide and Mitcham, than on the trial trip, and that exhaustion of power which Mr. Thow should have anticipated ensued immediately afterwards. We are inclined to think Mr. Thow did not then thoroughly realize what subsequent experience has taught him; but it certainly was his duty to have known accurately the capacity of the engine, and not to have allowed the train to start when there was any possibility of its not being able to reach its destination."

It seems that there is no head in particular on this railroad, and the three co-ordinate officers, each independent of the other, are jealous of each other and sometimes get into a snarl.

"In response to the request of the government the following reports from the Deputy Engineer-in-Chief, the General Traffic Manager and the Locomotive Engineer were received by the Chief Secretary on Monday, March 19:

"ENGINEER-IN-CHIEF'S OFFICE, March 15, 1883.

"SIR: I have the honor to acknowledge the receipt of your memorandum requesting me to furnish with as little delay as possible a report on the circumstances that caused the delay at Blackwood yesterday on the occasion of the opening of the railway to Aldgate. I think it will be seen on reflection that this is a inquiry into a matter with which have no concern. The business of the Engineer-in-Chief is

to construct and maintain the railways of the province, and he has had nothing whatever to do with their management and working for some years past. The immediate cause of the delay was evidently the failure of the engine to make steam, but the reason for this and the melting of the fire-bars are questions which can best be answered by the Locomotive Engineer. This officer was, at his own request, removed from the control of the Engineer-in-Chief some two or three years since, when he was gazetted as the independent head of a new department, and responsible only to the Minister. The Locomotive Engineer tested this or a similar engine with a train of nine empty carriages on the Mount Lofty inclines on the Tuesday preceding the opening, with the view of ascertaining what work it could do, and I was present with the Traffic Manager on that occasion. The very slow speed attained convinced me that four loaded carriages and a brake van would be a sufficient load for this engine, if it were intended to run at anything like the speed for which the line was designed, *i. e.*, 30 miles an hour. I had nothing whatever to do with the running arrangements of the opening day, beyond giving the Traffic Manager an undertaking that the line would be clear for any trains he might have to run.—I have, etc.,

"R. C. PATTERSON,
"Deputy Engineer-in-Chief."

"LOCOMOTIVE ENGINEER'S OFFICE, March 15, 1883.

"SIR—The stoppage which took place yesterday on the opening of the Hills Railway was, in my opinion, due to the unsuspected inability of the engine to drag a load behind it so much less in weight than it was stated to be able to deal with. This engine is an American passenger, and one of four imported by the Engineer-in-Chief's department especially for the Nairne Railway, under an indent and specification which required it to haul 120 tons behind it at an average speed between stations of 30 miles per hour, when working on an incline of 1 in 40. After delivery, this engine was tested by the Engineer-in-Chief before acceptance, and he certified that it had taken loads equivalent to 85 and 90 tons up 1 in 45 at actual speed of 32 and 29¾ miles per hour, and that in his opinion 'after the drivers became accustomed to them they would take 100 tons up the Nairne railway summit from Adelaide at a speed of 30 miles per hour.' Yesterday the engine had a total load of not more than 98 tons behind it; and it came to a dead stand after running six miles from Mitcham and up an incline of 1 in 50, and occupied 28 minutes in running that distance. It is thus proved that these engines are unsuitable—to an extent not hitherto suspected—for climbing duty. At the same time it should be mentioned that had the fire-bars not given way under the effort of the men to maintain steam by heavy firing it is probable the engine would have reached Blackwood without absolutely sticking on the road, but it would certainly have been necessary to have reduced the load at Blackwood before attempting the 1 in 45 grades. It should also be mentioned that the load was at the last moment before leaving Adelaide increased by an additional carriage and a large number of passengers, but even then it was well within the reputed capacity of the engine. No doubt it was well known to me that the engine would not do the work which by contract she should do, and I certainly doubted that she would perform what the Engineer-in-Chief certified before acceptance that she could do, but I never for a moment supposed she would prove to be such an utter failure as she did yesterday. It was not necessary to have run yesterday at a mean speed between stations of 30 miles per hour. No mention is made in the traffic order for the engine as to speed; and, since the power of an engine to haul increases as the speed decreases, I never imagined that so large an engine could fail to carry a train which the traffic order stated would consist of six passenger vehicles over the Hills line in a respectable manner. No doubt a second engine might for security have been employed, but we had to take into consideration the fact there was not a drop of water on the whole line available for locomotives, nor tanks even to hold it; and as it was had we not been able to secure a small quantity carted by the contractors for the two engines which were employed it is very doubtful if we could have brought both or either of the trains back to Adelaide so early as we did.—I have, etc.,

"WILLIAM THOW, Locomotive Engineer."

"GENERAL TRAFFIC MANAGER'S OFFICE, March 15, 1883.

"SIR—In obedience to your memo. of this date desiring a report on the circumstances that caused the delay at Blackwood yesterday, I have the honor to state that the immediate cause of the delay having been the failure at Blackwood of the engine attached to the train, the Locomotive Engineer is doubtless in a better position than I am to explain the fact, but as apparently there is some misapprehension on the subject, I avail myself of this opportunity of stating how far I or the department I represent was concerned in the arrangements for the opening day. You are aware that until a line is declared open for public traffic its working is in no way subject to the orders of the Traffic Manager, although in concert with the Engineer-in-Chief and the Locomotive Engineer he arranges for the running of what trains may be necessary in connection with the opening ceremony. So soon, therefore, that I was informed that the opening to Aldgate was fixed for the 14th instant I saw the Deputy Engineer-in-Chief and the contractors, and received their assurance that the line would be free for any trains on that day. I subsequently, in company with the Deputy Engineer-in-Chief and the Locomotive Engineer, traveled with a "trial train" of eight or nine vehicles from Adelaide to Mount Lofty, which train was drawn by an American engine. Neither then nor subsequently was I advised of the proper load to put behind one of these engines, but a day or two afterwards, meeting the Locomotive Engineer in your office, I said I supposed we should be all right with five or six carriages. He replied in the affirmative, and I instructed the traveling inspectors as to the composition of the train, as by copy of memo. attached, and marked "A." The Locomotive Engineer received similar advice in writing. The train was so made up, but slightly altered in composition early on the 14th under circumstances stated by Mr. McNeil in his report marked "B." The two first-class carriages taken off were long ones, and the three compos. substituted shorter. I do not think the aggregate weight of the train can have been seriously affected by the change. I estimate the total dead weight behind the engine was under 100 tons, which load surely the engine should have been equal to judging by the reports made of the capacity of this special type of engine. I have traveled on Messrs. Walker & Swan's engine over the road where we stuck, when she was propelling nine and pulling three trucks fully loaded with ballast, equal, I fancy, to 108 or 110 tons dead weight. May I respectfully express the opinion that this most unfortunate break-down points to one of two conclusions: First, that this type of engine is unfit for our Hills line; or, second, that the delay arose from one of those pure accidents to which every system is liable.—I have, &c.,

"ALAN G. PENDLETON."

[Memo. marked "A."]

"GENERAL TRAFFIC MANAGER'S OFFICE, March 12, 1883.

"MR. MCNEIL—Special with Governor and guests for Aldgate to be ready to start at 11.30 a. m. on 14th, B van, four large first-class carriages, and the Governor's carriage. An additional first must be sent by Mr. Hines' train same morning, which carriage must be shunted off at Mount Lofty to be picked up by the special. A. G. P."

[Report marked "B."]

"TRAFFIC DEPARTMENT, ADELAIDE STATION,
"March 14, 1883.

"To Mr. A. G. Pendleton, General Traffic Manager:

"I have the honor to inform you that in accordance with your instructions I got ready a train consisting of four first-class carriages and the vice-regal carriage and brake-van to run to Aldgate to-day. But at 10 o'clock yesterday evening I received the attached telegram from the Locomotive Engineer instructing that carriages picked for train should be fitted with brake-blocks. I drew Mr. Thow's attention to it at 10 this morning, and he expresses a fear that the engine would be unable to control the train on the gradients unless more brake power was added. I then consulted you *re* taking off two first-class carriages and putting on three composite carriages, which had brake-blocks, to which you agreed, and I subsequently saw Mr. Thow and gave him the number and description of carriages which were to be attached, and he informed me that they would do. I have, etc., JOHN B. MCNEIL, Train Inspector."

[Telegram.]

"To Mr. McNeil from William Thow.

"Do not send any carriages which are without continuous brakes on either train to-morrow."

It will be remembered that this Mr. Thow is one of the experts who reported that the Westinghouse brake is so complicated that it would not be well to adopt it in Australia. He is the head of the locomotive department of the South Australian railroads, and, it appears, does not believe in American railroads, which lack of faith will certainly be a strong obstacle to their success—on his roads.

The following letter to an Australian newspaper, signed "A Citizen U. S. A.," appears to be from a partisan of the American locomotive:

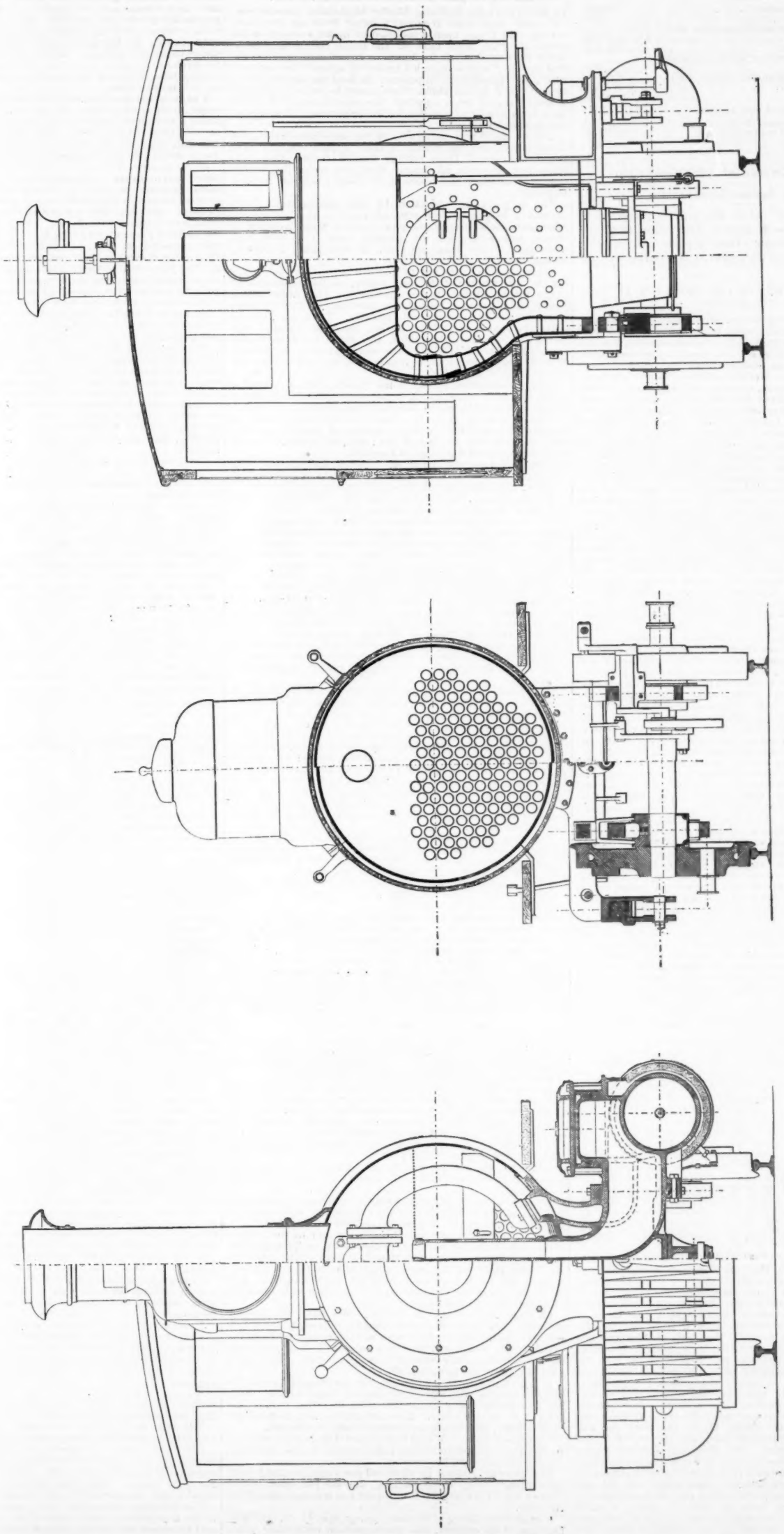
"Having been deeply interested in and sometimes amused by the various letters that have appeared almost daily since the day of that unfortunate failure on the Hills Railroad, I bethought me to find out if possible some facts about the engines concerned in the question. Accordingly, dressed in the usual blue serge and cap, I went in quest of a job to the running shed at Islington. Having some slight experience of railroad life in various parts of the world, I was, to say the least, amazed on my arrival at the running shed, to see the coal used, or abused, lying in great heaps on the ground, with ashes and clinkers mixed with some of it. Those who have much experience in coal consumption generally acknowledge that coal can undergo no worse treatment than lying exposed to the influence of the weather, and that its heat producing qualities deteriorate greatly, under these conditions. In the United States the stock kept on hand for emergencies is generally housed or closely packed. For daily consumption coal is brought as direct as possible from the mines, and is handled as little as possible to avoid breaking it into dust, as very small coal is unfit for locomotives. In England this, I believe, is the almost universal practice. The coal I saw at Islington was hardly fit for a Cornish boiler, much less for a locomotive, it having been so knocked about. It had perhaps been put on board ship in good condition, thence discharged into trucks, and then by men thrown on to the ground, to be again put by others into baskets, who with the assistance of a few more put it on to a locomotive tender in the manner now described. Two men lifted the full baskets on to a temporary stage, whereon were two more men, who placed the basket on the tender, where a fifth man emptied it. Thus through the want of a little common sense or foresight these new engine-sheds have no means for coaling engines other than those which were used fifty years since, and five men are employed to do the work which in plenty of large running-sheds where a vast deal more coal is used would be performed by two. In a place where so much room is available as at Islington what could be easier than to have a coal stage, say 10 ft. high, with an elevated line for coal trucks behind it, and a level or low line in front for engines wanting coal. This stage could be furnished with 30 iron trucks capable of holding 5 or 10 cwt. of coal each, and having tip ends they could be rolled along the stage from the railroad trucks and coal tipped into tenders as required. Two men could then keep all the engines supplied with coal and have some leisure to spare, besides always having some tons of coal loaded ready for any little rush of demand. I have seen four tons of coal placed on a tender in this way in three minutes.

Strolling into the shed in a leisurely way, in quest of the much maligned Yankee, I was amused to notice the variety of style displayed in the few English engines there. Although there were only about 14 of these engines in the shed, I noticed six different types or classes. Having dropped across the ones I was in search of, I found they were much the same as many of the same class I had seen elsewhere by other makers, but on close inspection I could see that the workmanship did not come up to that of some engines turned out by the Rogers, Danforth, or Mason Machine companies. I had often heard, before coming here, that the Baldwin was a "rough shop," but had never seen any of their engines before. Still I did not observe much to complain about in them. One very great point of difference between American and English engines is the fact that the Americans have steel fire-boxes (not fire-bars) and iron tubes or flues, while English engines have copper fire-boxes and brass tubes. Steel fire-boxes give great satisfaction in the States, and have been almost universally adopted, but here they seem to be the cause of continual annoyance, frequently leaking, a fault very rarely found in copper fire-boxes. Why this should be I cannot say, unless the leaking is caused by the water used here. Another great difference is in the wheels, which are very soft, and therefore liable to be cut flat, besides not being so durable as harder tires. The men about the shed seemed to be chary of giving any information, as, on my asking how the Yankee engines steamed (made steam) one said, "Oh, just middling," and another replied, "Not so bad;" but all agreed that they were splendid workers, and not very heavy on fuel and oil, while they were also smooth runners. I found that one of the heaviest engines had been doing very satisfactory work, and the engineer seemed pleased with his tool; in fact he said he believed "she would pull anything on the road that would hang together." Information as to durability of parts I could not obtain, as the engines have not had anything like a fair spell of work yet. Posted in a corner of the shed I saw a monthly return of fuel, oil, tallow, etc., and the mileage and tonnage of each engine and engineman, as compiled from daily returns, showing the cost of haulage per hundred tons for one mile. This return showed the Yankee engine in the most favorable light of any view of the question I have yet seen. The only American engine mentioned stood thus, omitting minor details: January, miles run, 2,781; gross load hauled (average for every mile), 418 tons; coal consumed per mile, 54 lbs.; cost per 100 tons per mile, 1.86 pence. The next heaviest load, by an English engine, was 240 tons, but the average for the 23 engines mentioned was only 181 tons; coal consumed per mile, 32 lbs.; cost per 100 tons per mile, 2.73 pence. The figures therefore showed very much in favor of the Baldwin. But a more just comparison would also include wages of the train staff, an engineer, stoker, guard, and cleaner; and basing my calculations on 150 miles for a day's work (a very heavy day), and at a rough estimate of £1 16s. for train staff, I hope to come somewhat nearer to a fair comparison. One hundred and fifty miles at £1 16s. will give 2.9d. per train mile, and in case of an average load of 418 tons will cost 0.7d. per hundred tons per mile. With the average load of the others, 181 tons, the cost will be 1.6d. per hundred tons per mile. This gives the following results: American—Load, 418 tons; coal, 54 lbs; cost fuel, etc., 1.86d.; wages, 0.7d.; total cost, 2.56d. per 100 tons per mile. English—181 tons; coal, 32 lbs.; cost fuel, etc., 2.73d.; wages, 1.6d.; total cost, 4.33d. per 100 tons per mile. American cost, 2.56d.; English cost, 4.33d.; difference in favor of American, 1.77d. These facts speak for themselves. As there has been no small cry about the enormous cost of these engines, I submit that if any one will look at the matter in this light they will see but little cause to complain. The American invoice price was £2,700, and the last new English engine, I believe, cost £2,000. But as the lowest ratio of comparison in power is American three to English two, American is much the cheaper. Taken as weight, the American engine is nearly double the weight of the English, and is therefore much cheaper. Besides this, the Yankees are supplied with very capacious tenders, carrying an immense quantity of fuel and water, whereas these latest imported engines cannot take a load from Adelaide to Gawler without replenishing with water on the way, and they must also get a supply of coal almost every 40 miles they travel. I have not the least doubt that the Yankee engines will establish for themselves a reputation for efficiency before long, and that with proper handling they will surprise their detractors, both by work and economy. American engines have a world-wide reputation, and have not failed outside of South Australia. In fact they are giving great satisfaction in Queensland and New Zealand, and all the various republics in South America, where an English engine is now rarely seen, and it only seems a common-sense view of the matter to say that now we have American engines here, and have paid for them, we should make the best use possible thereof. It seems strange indeed that on the failure of an English engine the other day on the Nairne Railroad no one heard anything about it, and when the same engine ran off the track the day following the matter was completely hushed up by every one concerned.

Narrow-Gauge Consolidation Locomotive.

The double page and smaller engravings in the present number represent a narrow-gauge consolidation locomotive built by the Baldwin Locomotive Works and exhibited at the Chicago Exposition of Railway Appliances. The following are the principal dimensions of this engine:

Kind of fuel used	Bituminous coal.
WEIGHT AND GENERAL DIMENSIONS.	
Gauge of road	3 ft. 0 in.
Total weight of locomotive in working order, including two men (estimated)	56,000 lbs.
Total weight on driving wheels (estimated)	48,000 lbs.
Total wheel base	17 ft. 10 in.
Distance between centre of front and back driving wheels	11 ft. 4 in.
Distance from centre of main driving wheels to centre of cylinders	7 ft. 10 in.
Length of main connecting-rod, from centre to centre of journals	4 ft. 4 in.
Transverse distance from the centre of one cylinder to the centre of the other	5 ft. 0 in.
CYLINDERS, VALVES, ETC.	
Diameter of cylinders and stroke of piston	15 in. × 18 in.
Horizontal thickness of piston over piston head and follower plate	4¼ in.
Kind of piston packing	Steam packing.
Diameter of piston rod	2¼ in.
Size of steam ports	12 in. × 1¼ in.
Size of exhaust ports	12 in. × 2½ in.
Greatest travel of slide valves	4¾ in.
Outside lap of slide valves	⅞ in.
Inside lap of slide valves	1-32 in.
Lead of slide valves in full stroke	1-32 in.
Throw of upper end of reverse lever from full gear forward to full gear backward, measured on the chord of the arc of its throw	3 ft. 8½ in.
Sectional area of opening in each steam pipe connected with cylinder	15 sq. in.
WHEELS, ETC.	
Diameter of driving wheels, outside of tires	36 in.
Diameter of truck wheels	24 in.
Size of main driving axle journal, diameter and length	6 in. × 7 in.
Size of other driving axle journals	5½ in. × 7 in.
Size of truck axle journals	3½ in. × 6 in.
Size of main crank-pin journals	4 in. × 4 in.
Size of coupling rod journals	3 in. × 3 in., f. and b. 3½ in. × 3 in., middle.
Length of driving springs, measured from centre to centre of hangers	2 ft. 2 in.
BOILER.	
Description of boiler	Straight top.
Inside diameter of smallest boiler ring	47½ in.
Material of barrel of boiler	Iron.
Thickness of plates in barrel of boiler	7-16 in.
Kind of horizontal seams	Lap seam double riveted.
Kind of circumferential seams	Single riveted.
Material of tubes	Iron.
Number of tubes	138.
Diameter of tubes, outside	2 in.
Distance between centres of tubes	2⅝ in.
Length of tubes, over tube plates	10 ft. 0 in.
Size of fire-box, inside, length × width × depth from under side of crown plate to bottom of mud ring	79 7-16 in. × 24⅜ in. × 39¾.
Water spaces, sides, back and front of fire-box	2½ in. 2½ in. 3½ in.
Material of outside shell of fire-box	Iron.
Thickness of plates of outside shell of fire-box	7-16 in.
Material of inside of fire-box	Steel.
Thickness of plates in sides, back end and crown of fire-box	5-16 in. 5-16 in. ⅜ in.
Material of tube-plates	Iron front. Steel back.
Thickness of front and back tube-plates	½ in. ½ in.
How is crown-plate stayed, with girder or screw stays?	Radial stays.
Diameter and height of dome	28 in. × 28½ in.
Maximum working steam pressure per square inch	130 lbs.
Kind of grate	Rocking.
Width of bars	⅝ in.
Width of opening between bars	⅝ in.
Grate surface	13.5 sq. ft.
Heating surface in fire-box	75 sq. ft.
Heating surface of the inside of tubes	722 sq. ft.
Total heating surface	797 sq. ft.
Kind of blast nozzle, single or double	Double.
Diameter of blast nozzle	3 in.
Smallest inside diameter of chimney	15 in.
Height from top of rails to top of chimney	12 ft. 5 in.



NARROW-GAUGE CONSOLIDATION LOCOMOTIVE.

Built by the BALDWIN LOCOMOTIVE WORKS, *Philadelphia.*

TENDER.	
Number of wheels under tender	Eight.
Diameter of tender wheels	24 in.
Size of journals of tender axles, diameter and length	3½ in. × 6 in.
Total wheel-base of tender	14 ft. 3 in.
Distance from centre to centre of truck wheels of tender	58 in.
Water capacity of tank (in gallons of 231 cubic inches)	1,500 galls.
Coal capacity of tender	6,000 lbs.
ENGINE AND TENDER.	
Total wheel-base of engine and tender	40 ft. 2 in
Total length of engine and tender over all	49 ft. 5 in.

MASTER MECHANICS' ASSOCIATION.

Sixteenth Annual Convention.

We give herewith several of the reports presented by committees of the Master Mechanics' Association at the recent convention in Chicago. These reports lack of space compelled us to omit from the report of the convention published last week.

REPORT ON THE EXTENSION OF THE SMOKE-BOX IN LOCOMOTIVE ENGINES.

To the American Railway Master Mechanics' Association:

GENTLEMEN: In reporting upon the benefits derived from the use of the extended smoke-box or spark arrester, I would most respectfully state that my 2½ years' experience in its use, and the expressed opinion of several master mechanics my seniors in experience, find the extended smoke-box beneficial to this extent, namely, economy in fuel, cones, netting, smoke-stacks, etc., also more free and regular steaming qualities, insuring against fires and guaranteeing cleanliness to both train and engine. I now have 21 locomotives equipped with the extended smoke-box or spark arrester, 13 being in passenger and 8 in freight and switching service. During the past 2½ years that it has been in use no fires have been reported on the line of road and blame attached to any engine equipped with the extended smoke-box. We have a much cleaner and pleasanter train, as most of the sparks are deposited in the extended smoke-box, and not hammered back over train to annoy passengers, injuring newly-painted or varnished coaches, etc. As a rule, with a train consisting of from four to six ordinary coaches and a fair quality of coal, such as is used upon Western roads, the locomotive will deposit from 40 to 50 bushels of sparks in the extended smoke-box in 100 miles run. This of itself is appreciated by the passengers and quite an advertisement for the road. In point of economy there is a saving in fuel, but to what extent I am unable to state, but certainly some, since we can use from ¼ to ½ inch larger exhaust openings, thereby gaining a better steaming engine, and consequently a saving in fuel. Mr. James Meehan, General Master Mechanic, Cincinnati, New Orleans & Texas Pacific Railway, claims a 20 per cent. saving in fuel compared to the old diamond stack and lift pipe. Mr. Meehan, in connection with the extended smoke box, also uses the brick arch in fire-box. I find quite a saving in netting, cone, smoke-stacks, etc., as these several parts used with the extended smoke-box will last about as long as any other part of the box or boiler, there being no hammering of sparks to wear them out. We, of course, have a more free working engine, owing to the large exhaust openings. This is accomplished by using the high exhaust pipes and diaphragm plate, which reverse the draught upon the fire, through the top flues first, instead of the bottom, therefore we obtain a more general and uniform draught upon the fire and the benefit of all the flues in the boiler, which is impossible with the low exhaust and lift pipe, as a number of the lower or bottom flues are as a rule, stopped up by cinders, etc., also a number on each side of the boiler had just as well be, for all the advantage that is derived from them is but of slight benefit to the steaming of the engine. In my opinion there is no question as to the merits of the extended smoke-box, straight stack, high exhaust and diaphragm plate, but it is like all other parts of the engine, if the work is not properly done the engine will not do well. I am very sure that roads that have tried the extended smoke-box and pronounced it a failure had it applied to their boilers in an improper manner. It is highly important that both the smoke and extended arches be as near air tight as it is possible to make them; in fact should be as air tight as the boiler is steam tight. If attention is paid to their construction and the work properly executed they cannot fail to be a success and improvement over the old diamond stack, cone and netting. I here give prints showing three plans of arranging the netting, spark pipes, diaphragm plate, etc., all of which I have experimented with. Print marked "Extended front adopted by Cincinnati, Indianapolis, St. Louis & Chicago Railway" is the arrangement I have adopted for general use, as I find it to work the best. I find the diaphragm plate indispensable with the high exhaust. In cutting down the exhaust below the top row of flues and dispensing with the diaphragm plate by using a perforated spark-pipe, as shown in one of the prints, I experienced considerable trouble in throwing the sparks far enough forward in the extended smoke-box, consequently the sparks accumulated too near the bottom flues and around the bottom of the steam pipes, but with the diaphragm plate and high exhaust they are thrown well forward and out of the way. Mr. Meehan, General Master Mechanic Cincinnati, New Orleans & Texas Pacific Railway, informs me that his company paid in last year for fires on their Lexington Division $30,000, when using the old diamond stack, and on same division this year by using the extended smoke-box, there were no fires. I annex a statement from Mr. Meehan, showing saving in fuel of different engines on his road by the use of the extended smoke-box and brick arch in fire-box, as against the old diamond stack.

Respectfully, J. S. PATTERSON.

Showing Saving in Fuel Effected on Engines on Cincinnati, New Orleans & Texas Pacific Railway Equipped with the Extended Smoke-box.

WITHOUT EXTENDED SMOKE BOX, 1882.						WITH EXTENDED SMOKE BOX, 1883.						
No. of Engine	Size of cylinders	Mileage	Service	Coal consumed	Pounds per mile	No. of engine	Mileage	Service	Coal consumed.	Pounds per mile	Saving in favor of the extended smoke-box
9	16x24	5,192	Pass.	2,880	44	9	4,430	Pass.	1,860	24	10
45	17x24	5,032	Pass.	4,020	64	45	4,756	Pass.	2,025	44	32
38	18x24	2,018	Freight.	2,465	98	34	2,492	Freight.	2,050	66	32
17	17x24	2,649	Freight	2,982	90	17	2,491	Freight.	1,825	64	26
21	17x24	2,376	Freight.	2,840	65	21	2,418	Freight.	1,625	54	41
27	17x24	5,143	Pass.	4,345	68	27	5,310	Pass.	3,175	48	20
43	18x24	2,958	Freight.	3,045	85	43	2,485	Freight.	2,075	67	18
46	17x24	4,746	Pass.	4,282	72	46	4,746	Pass.	2 87	48	24

REPORT ON BEST POSITION OF CHECK VALVES.

To the American Railway Master Mechanics' Association.

I some time since received a letter from our Secretary saying that I had been appointed to make a report on the question: "In what Part of the Boiler should the Check-valve be located either for Pump or Injector to produce the best results?" and although I protested against the appointment, and pleaded incompetency, he held me strictly to the task. * * * I do not think it necessary to make a very voluminous report on a question the general points of which have been practically settled by the experience of scores of locomotive builders. * * *

I have written to a number of my associates, asking for information, and the results of their experience, but have received answers from only a few of them; those who answered, however, all agree that the only practicable policy is to place the check as far away from the fire-box as possible.

The only serious objection to this arrangement is the necessary length of feed-pipe exposed to the cold air; no effort is made to protect the pipe leading from injector to check, and with cold air passing over it at such high velocities, a very large per cent. of heat must be lost by radiation.

Theory points to the leg of the fire-box as the best place for the admittance of the feed water, as the admission at this point would give better circulation, the water rising rapidly as it becomes heated, and moving to different parts of the boiler with considerable velocity. Then, also, the leg being the lowest part of the boiler, the cold water is supposed to flow toward that point, and there is a general idea that in this part of the boiler the temperature is the lowest. It would seem, therefore, as if this were the proper place for the location of the check.

Acting upon this theory some years since, I placed a check on one of our engines, in the centre of forward end of fire-box, about 8 in. above the mud-ring.

Within a week from the time that the engine went to work, all the stay-bolts within two feet of that check were leaking a stream inside and out; and, of course, I had to take the check off and place it forward.

This feed water was from an injector, and so was quite warm; had it been from a pump and with no attempt at heating, I presume the effect would have been still worse.

My experience, therefore, is, that the check valve must be kept as far away from the fire as possible. On this point I believe nearly all the locomotive builders are agreed, but farther than this there is a conspicuous lack of unanimity.

Some say that the check should be placed at a mud-drum located under shell of boiler; others report that with the water they use mud-drums will fill up so quickly with sediment and scale that they cannot use them to feed into.

Mr. Boon, of the Chicago & Northwestern, recommends the placing of the check under the belly of the boiler, and gives as one of his reasons that it is a more protected locality, and in case of a rear collision there is little danger of the check-valves being knocked off and people scalded by the escaping steam; and as we know of so large a number of serious and fatal accidents having occured in this manner, I believe that this consideration should receive some attention.

There have been numerous unsuccessful efforts made to feed into a perforated tube carried along inside of boiler, but this plan has been given up on account of the large amount of sediment which would rapidly fill the pipe, making the passage of water through it almost impossible.

Of course, as you all know, there have been large numbers of smoke-box heaters constructed, mostly of coils of pipe, in some form or another; these also have not been generally successful because they cluttered up the smoke-box so that the draught was obstructed, and pipes containing cold water, placed in the smoke-box, will sweat and soon become covered with soot; and when so covered they lose their conducting power.

Formerly I practiced placing the check-valve at about the centre of the forward sheet and below the water line, but when so located I had some little trouble with a few of the flues with which the cold water came in contact.

I then changed the feed-pipe, running it through the side of the smoke-box and into the flue-sheet, with the check-valve just outside of smoke-box.

This gives the water entering the boiler a motion parallel with the flues, and it seems to have had no effect on them, for with this arrangement we have no trouble with leaky flues in the vicinity of the check.

I have no doubt that a large number of the members present can relate their troubles and experiments in this matter, and undoubtedly an open discussion would be more productive of information than the researches of any one man. Respectfully, T. B. TWOMBLY.

REPORT ON METALLIC PACKING.

To the American Railway Master Mechanics' Association:

Your committee, appointed to ascertain the desirability of using Metallic Packing for Locomotive Piston Rods and Valve Stems, beg leave to submit the following:

In order that the Association receive the benefit of a general expression of opinion on the subject, I mailed the following interrogatories to the Master Mechanics of 75 of the principal railroads: "Are you using metallic packing on any of your engines; if so, how many?

"How does it compare with other kinds as to wear on piston rods and valve stems?

"What is the cost per annum for repairs? And any suggestion deemed beneficial to the association (on the subject) is solicited."

In reply to my inquiries, the master mechanics representing railroads reported having no experience with metallic packing, were unable to give the desired information.

As it is my desire that this Association may be thoroughly conversant as to the merits or demerits of metallic packing for the purposes above mentioned, I have concluded that the better mode for accomplishing that is to report (in substance) the verdict of each railroad representative, and from the whole the Convention will be better able to arrive at an intelligent conclusion.

Chicago, Rock Island & Pacific.—We have the Jerome metallic packing on 60 engines, and are putting it on all new engines built, and on the old ones as fast as they come in for repairs. Its action on piston and valve rod is much more satisfactory than any packing I have ever used. Estimated cost of repairs per annum is $3.

It is no uncommon occurrence for an engine to run for sixteen months with one set of packing rings, with no leaking or trouble of any kind. The wear on piston rods is less than ⅛ in. in two years. The metallic packing is perfectly satisfactory, and much superior to hemp or asbestos.

Chicago & Iowa.—We have adopted the Jerome metallic packing for piston and valve rods, having so far seven engines equipped with it.

The wear to pistons is about 90 per cent. less than with the ordinary soap stone packing, and 50 per cent. less on valve rods. Cost to keep it in repair has not exceeded $3 in the year.

Connecticut River.—We are using the U. S. metallic packing on six engines, and in comparison with other packing I think it is preferable.

Philadelphia, Wilmington & Baltimore.—We are using the U. S. metallic packing on piston rods of four engines and valve stems of one engine. I have found that the pistons fitted with this packing will last much longer than with ordinary packing, running sometimes two years without turning. On the valve stems it does not do so well, as it wears them much faster. This I attribute to the fact that the pressure is constant on the packing while the engine is using steam, while on the piston the pressure is on the packing not half the time.

I have found also that the Babbitt rings on valve stems wear much faster than on pistons. The wear on valve stems I have found to be nearly as great with this packing as with good packing used in the ordinary way. I am satisfied that the use on the piston is much cheaper, while for valve stems I do not consider it of much advantage.

Jeffersonville, Madison & Indianapolis.—Some years ago there were several engines on this road equipped with metallic packing in piston glands, but the wear was so much greater on piston rods, and leakage much greater than with ordinary packing, that it was abandoned. We have, however, two engines with it yet. Those engines are employed on inclined plane at Madison, Ind. There we think the metallic packing in pistons is indispensable, owing to the fact that going down hill those engines use the compression of air in the cylinders (the valve gear being reversed) to regulate their speed descending the hill, and in so doing the piston rods do not have the advantage of steam as a lubricant, so that ordinary packing is soon burnt out.

As before intimated, the work on the Madison hill being peculiar to itself, I cannot give you any particulars as to comparison in cost for repairs, etc.

Wilmington & Weldon.—We have used the different kinds of metallic packing on piston rods and valve stems, but do not like it and have none in use now. I do not consider it as good as the ordinary packing in common use.

New York, West Shore & Buffalo.—We have adopted the metallic packing as a standard for all our engines, and use no other. Have at present sixty engines equipped with this packing, some of which have been in service the past ten months, and up to the present I am unaware of any renewals.

I consider it far superior to common packing. Its wear on piston and valve rods is almost imperceptible, and being truly cylindrical, does not groove the rods like common packing.

Central of New Jersey.—We put on two sets of metallic packing (made by U. S. Metallic Packing Co.) for trial. That on piston rods worked very satisfactorily, but on value stems it did not do so well, on account of carrying arrangements not being perfected.

The wear on rods was regular and true, which is the opposite result when fibrous packing is used.

Chicago & Northwestern.—Several years ago I experimented with metallic packing, and was not favorably impressed with it. I found it cost about $7 per annum for each engine when hemp was used. The packing I tried was a patented article; the royalty was $10 per engine, and cost about $20 per engine to fit up. It ran successfully for about one year, when new rings were needed. I could not discern any less wear in the rods with the metallic than with hemp packing, so we abandoned its use.

With metallic packing more care is needed in setting up than with hemp. When there is a careful man on the engine who remains with it, a better result is obtainable.

On a road where there are a large number of engines, and men are being frequently changed, trouble is inevitable when metallic packing is used. The packing I experimented with was gotten up in the shape of two cones slightly tapered, one linked within the other. Steam blew through and the engineer screwed it up too tight, wedging both together so that the rock shaft broke in trying to start the engine. I think when the first cost of metallic packing is considered, the royalty added, the total amount will pay for hemp packing for a long time. The metallic packing that I have seen needs too much care to keep in order, and experience shows that this care is not given, hence trouble and expense.

Fitchburg.—We have one hundred engines on the road, all of which are fitted up with metallic packing, which gives good satisfaction. The wear on pistons and valve rods is much less than with soft packing. I think $10 would cover the cost of repairs per annum for each engine.

Some of our engines run two or three years without any repairs to those parts. We use the United States metallic packing.

Boston & Providence.—We have metallic packing on piston rods of two engines, and on three sets of valve stems. From my limited experience with it I am not well pleased with its service.

Ohio & Mississippi.—We have used a combination of rubber and metallic packing on the valve stems of ten engines on the Springfield Division for the past six months, and the Master Mechanic reports that it gives very good satisfaction, costing only an occasional renewing of the rubber to keep it in good working order. The first cost is about $3 per engine for valve stems only.

We do not say this is the best kind in use, but it is a great improvement on hemp, and wears the valve stems very little. I have used a concave rubber filled in with hemp which gives good satisfaction, but believe a metallic packing can be gotten up that will give better results.

New York, Pennsylvania & Ohio.—We have over 200 locomotives equipped with the United States Metallic Co.'s packing. The wear on piston rods and valve stems is so near cylindrical that once in three years is as often as rods require to be turned up; in fact, piston rods, if properly cared for, will run five years before they require turning.

The cost per annum to maintain the packing is about $4.70 per engine, while the hemp and other kinds used cost from $25 to $30 per packing, besides the excessive wear and friction on the piston and valve stems, which is practically got rid of by using the metallic packing made of Babbitt metal.

I have been using this kind of packing for seven years with excellent success, and would not know how to get along without it if forced to return to the old kinds of packing.

There are great advantages derived from its use in the saving of wear and of piston and valve rods. The engine is always ready for service when needed, without having to go through the stereotyped routine of packing my engine before I go out, if an extra trip is required from the engineer.

Kansas City, Fort Scott & Gulf.—We are using metallic packing on our engines for four years; have about fifty engines equipped with it.

The wear on the piston and valve rods is not more than one-fifth as much as when packed with hemp.

I find the success of metallic packing depends largely on having the rods kept well lubricated. I have had so far no occasion to turn off piston rods which have been in engines for four years. Once the engine equipped, the cost for repairs does not exceed $1 per annum.

The difficulty in keeping valve stems packed is due chiefly to the unequal wear on account of the variation of the travel, and to reduce this to the lowest minimum I have adopted the plan of a case-hardened sleeve on valve stems which works well. Taking everything in consideration, I must

say from my experience that the metallic packing is much superior to any other kind known to me.

Missouri Pacific.—We are using Hewitt's piston rod packing on over three hundred engines. It wears several times longer than hemp packing, and preserves the face of the rod in a very smooth and perfect condition.

The cost per annum for repairs does not exceed one dollar per engine, exclusive of work done when engine is in shop for general repairs.

We have piston rods running with it in engines that have made over 100,000 miles, and yet in good condition. There is no extra skill required, either to make or apply this kind of packing; and if rings are put in alternately it needs no attention except to take up slack of jam-nuts about once in five hundred miles of service.

The metal best adapted is an alloy of lead and antimony about 5 or 6 per cent. of antimony to about 94 or 95 per cent. of lead.

The foregoing being an expression of opinion from different railroads, and the results of practical demonstration, will, I hope, be of interest to all concerned in railroad economy. As far as my personal experience on the subject is concerned, I will state that we have 16 engines equipped with metallic packing in piston rods and valve stems. Its use for pistons I do not hesitate to say that it excels anything I have ever used for that purpose, but I must admit its results on valve stems are unsatisfactory with us. The different mode of its appliance doubtless gives various results; I simply state my experience with it for each purpose.

As may be seen by my inquiries, my object is not to ascertain what particular kind is preferable, but rather is any kind of metallic packing desirable. I will not, therefore, dwell on the merits of each, but inasmuch as the replies mentioned the particular kinds (in many cases), I also let them appear in this report, thinking it may be beneficial to the interests which we have assembled here to represent. Before closing the report, I wish to take this opportunity of returning my sincere thanks to the different master mechanics who so kindly responded to my inquiries, and by that means aided me to perform the pleasing duty of contributing some beneficial information toward the progress and advancement of American railway interests. R. H. BRIGGS.

Stopped for Refreshments.

A drummer taken in.—"Will I have time to step off and get some refreshments?" asked a drummer on a Texas railroad of the conductor, as the train stopped at a station. "You will have plenty of time." The drummer stepped off and the train went on without him. The next time the druttimer saw the conductor he took him to task very severely for his conduct, complaining that he had to lay over at that station seven hours. "Well," replied the conductor, "you asked me if you would have time to get some refreshments, and if you couldn't get all you wanted in seven hours it seems to me you are a hog." Verdict for the conductor and no appeal.—*Texas Siftings.*

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the present volume of the *Railroad Gazette:*

	Page.		Page.
Atchison, Topeka & Santa Fe	7, 246	Manhattan	181
Atlantic & Pacific	340	Mexican Railway	361
Augusta & Knoxville	356	Michigan Central	229, 280
Baltimore & Potomac	427	Milwaukee, Lake Shore & West	395
Bangor & Piscataquis	213	Missouri, Kansas & Texas	231
Boston, Barre & Gardner	73	Missouri Pacific	167, 230
Boston, Concord & Montreal	356	Morris & Essex	407
Boston & Lowell	23	Natchez, Jackson & Col	196
Boston, Revere Beach & Lynn	100	New Haven & Northampton	7
Bur., Cedar Rapids & No	232	New London Northern	138
Camden & Atlantic	179	N. Y. Cen. & Hudson River	7, 8
Canada Southern	396	N. Y., New Haven & Hartford	22
Canadian Government Roads	213	N. Y., Ontario & Western	197
Central Branch	231	N. Y., Penn. & Ohio	213, 214
Central Iowa	396	N. Y., Susquehanna & Western	356
Central, of New Jersey	312	Norfolk & Western	180
Central Pacific	163	Northern Central	123
Charlotte, Col. & Augusta	23	Northern (New Hampshire)	340
Chesapeake & Ohio	138	Ogdensburg & L. Champlain	407
Cheshire	339	Ohio & Mississippi	105
Chicago & Alton	122, 142	Oregon Improvement Co	278
Chicago, Bur. & Quincy	7, 196, 230	Panama	231
Chi., Mil. & St. Paul	73, 167, 283, 285	Pennsylvania & N. Y	73
Chi., Rock Island & Pacific	340, 443	Pennsylvania Railroad	150, 154
Cincinnati, N. O. & Tex. Pac	39, 395	Philadelphia & Reading	22
Cleve., Col., Cin. & Ind	181, 183	Phila., Wil. & Baltimore	139
Cleveland & Pittsburgh	39	Pittsburgh, Cin. & St. Louis	312
Columbia & Greenville	59	Pittsburgh, Ft. Wayne & Chi	340
Concord	356	Pittsburgh & Lake Erie	40
Connecticut River	105	Portland & Ogdensburg	100
Delaware & Hudson Canal	100, 122	Portland & Rochester	100
Delaware, Lacka. & Western	122	Providence & Worcester	104
Del., Lac. & W. Leased Lines	407	Rochester & Pittsburgh	41
Des Moines & Fort Dodge	362	St. Louis, Iron Mt. & So	167, 231
Denver & Rio Grande	362	St. Louis & San Francisco	197
European & North American	22	St. L., Vandalia & Terre Haute	246
Fitchburg	40	St. Paul & Duluth	404
Flint & Pere Marquette	362	Savannah, Florida & West	312
Georgia	312	Sioux City & Pacific	213
Grand Trunk	59, 229	South Carolina	89, 121
Hannibal & St. Joseph	163	Sullivan County	427
Hanover Junc., Han. & Gettysb	355	Sussex	407
Hartford & Conn. Western	7	Terre Haute & Indianapolis	362
Housatonic	196	Texas & Pacific	231
Houston & Texas Central	39	Union Pacific	164
Huntingdon & Broad Top	312	Utah Central	246
Illinois Central	167, 180, 182	Valley, of Ohio	280
International & Great No	231	Vermont Valley	427
Kentucky Central	246	Virginia Midland	100
Lake Shore & Mich. So	278, 298, 306	Wabash, St. Louis & Pac	167, 180
Lehigh Coal & Navigation Co	138	Warren	407
Lehigh Valley	73	Western R. R. Association	37
Little Rock & Ft. Smith	273	West Va. Central & Pittsburgh	313
Long Island	73	Woodstock	100
Maine Central	21	Worcester & Nashua	40
Manchester & Lawrence	395	York & Peachbottom	355

Cincinnati & Eastern.

This company owns a line completed from Idlewild east to Ottawa, O., 84 miles, a branch from Richmond Junction to Richmond, 11 miles, and a branch from Sardinia to Hillsboro, 19 miles. An extension from Ottawa to Portsmouth, 19 miles, is nearly finished, and one from Portsmouth to Gallipolis, 65 miles, will soon be begun. The Cincinnati Northern track is used from Idlewild to Cincinnati, 3 miles. The report is for the year ending June 30, during which the road was extended 20 miles.

The funded debt is as follows:

First-mortgage bonds	$498,100
" " Ohio River Branch	86,800
Second-mortgage bonds	259,500
Six per cent. mortgage bonds	196,600
Total	$1,041,000

An issue of $2,000,000 consolidated mortgage bonds has been authorized.

The earnings for the year were as follows:

Earnings ($1,199 per mile)	$128,253
Expenses (64.44 per cent.)	82,662
Net earnings ($426 per mile)	$45,591
Rental paid Cincinnati Northern Co	18,097
Surplus	$27,494

The rental paid the Cincinnati Northern is considered exorbitant, and arrangements have been made to build an independent entrance into Cincinnati.

A controlling interest has lately been sold to a syndicate, which undertakes to complete the road to Portsmouth, to build an extension from that city to Gallipolis, and to build a line into Cincinnati.

Cincinnati, Hamilton & Dayton.

This company owned and operated the following lines during its last fiscal year, ending March 31, 1883:

	Miles.
Main line owned, Cincinnati to Dayton, O	59.9
Dayton & Michigan, leased, Dayton to Toledo	142.1
Cin., Hamilton & Indianapolis, owned, Hamilton, O., to Indianapolis	98.9
Cin., Richmond & Chicago, leased, Hamilton, O., to Richmond, Ind.	44.0
McComb, Deshler & Toledo, operated	8.9
Total	353.8

There are 19.8 miles of second track and 68.9 miles of sidings, making a total of 442.5 miles of track.

The equipment consists of 92 locomotives; 70 passenger and 28 baggage cars; 1,503 box, 178 stock, 514 flat, 516 coal and 31 caboose cars; 5 wrecking cars. The increase was 7 locomotives; 10 passenger cars, 277 box, 50 flat and 169 coal cars.

The general account is as follows, condensed:

Common stock		$3,500,000.00
Preferred stock		347,900.00
Funded debt		2,908,000.00
Accounts and balances		882,499.45
Surplus earnings		2,007,932.60
Total		$9,646,332.05
Road and property	$5,761,787.20	
Stocks and bonds owned	951,097.76	
Materials	254,593.52	
Accounts and balances	2,435,014.37	
Cash and cash items	243,839.20	
		9,646,332.05

The funded debt consists of $465,000 second-mortgage bonds (now a first lien), and $2,443,000 consolidated bonds. Last year $347,900 preferred stock was sold to pay for improvements; $4,000 bonds were sold and $50,700 bonds retired.

The accounts of the leased lines are as follows:

	Dayton & Mich.	Cin., Rich. & Chi.	Cin., Ham. & Ind
Common stock	$2,403,100	$382,600	
Preferred stock	1,211,250		281,679
Funded debt	2,736,300	625,000	2,590,000
Accounts, etc	772,661	129,104	1,073,744
Total	$7,123,311	$1,136,704	$3,855,423

The accounts and balances, outside of stock and bonds, are chiefly balances due the lessee for improvements and advances made.

The traffic for the year was as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Train miles	2,584,324	2,342,172	I. 242,152	10.3
Pass. car miles	4,047,599	3,476,781	I. 570,818	16.4
Freight car miles	21,428,572	18,757,572	I. 2,671,000	14.2
Passengers carried	1,817,438	1,720,667	I. 96,771	5.6
Passenger-miles	45,057,054	42,183,434	I. 2,873,620	6.8
Tons freight carried	1,872,424	1,532,479	I. 339,945	22.1
Ton-miles	162,588,459	148,740,700	I. 13,847,759	9.3
Average rate:				
Per pass.-mile	2.300 cts.	2.324 cts.	D. 0.024 ct.	1.0
Per ton-mile	1.146 "	1.176 "	D. 0.030 "	2.6

The average passenger car-load last year was 11.13 passengers; the average freight car-load was 7.59 tons.

The earnings for the year were as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Freight	$1,855,381	$1,748,872	I. $106,509	6.1
Passengers	1,057,201	980,530	I. 50,671	5.8
Mail and express	96,138	88,727	I. 7,411	8.3
Miscellaneous	99,687	143,318	D. 43,631	30.5
Total	$3,088,407	$2,961,447	I. $126,960	4.3
Expenses	2,014,907	2,031,684	D. 16,757	0.8
Net earnings	$1,073,500	$929,783	I. $143,717	15.5
Gross earn'gs p. mile	8,729	8,370	I. 359	4.3
Net "	3,034	2,628	I. 406	15.5
Per cent. of exp's	65.24	68.64	D. 3.40	....

Renewals of track during the year included 1,790 tons of steel rails and 129,529 new ties. There are still 98.1 miles of track laid with iron.

The results for the various lines were as follows:

	Earnings.	Expenses and Interest.	Surplus or Deficit.
Cin., Ham. & Dayton	$1,162,755	$1,060,223	S. $102,532
Dayton & Mich	1,248,075	1,046,936	S. 201,139
Cin., Rich. & Chi	254,003	198,125	S. 55,878
Cin., Ham. & Ind	423,574	525,405	D. 101,831
Total	$3,088,407	$2,830,689	S. $257,718

The McComb, Deshler & Toledo is included above with the Dayton & Michigan; its earnings were $6,299; expenses, $6,412; deficit, $113. Its business has been injured by the building of a new road through McComb.

The income account was as follows, condensed:

Net earnings, as above		$1,073,500.31
Interest, rentals, etc	$736,871.64	
Accrued interest charges, not yet due	74,562.50	
Dividends on new preferred stock	4,348.32	
Dividends on common stock, 6 per cent.	210,000 00	
		1,025,782.46
Balance, surplus for the year		$47,717.85
Preferred stock and bonds sold		351,900.00
Increase of liabilities and decrease of assets		113,284.40
Balance, April 1, 1882		272,410 48
Total		$785,312.73
Bonds retired	$44,000.00	
Construction and equipment	428,184.38	
Toledo elevator	69,289.15	
		541,473.53
Cash and cash items, March 31, 1882		$243,839.20

The New York, Pennsylvania & Ohio traffic was restored to this road in July, 1882. There was some diversion of business from the Indianapolis line by the extension of the Indiana, Bloomington & Western road from Indianapolis to Springfield. The claims of the road for an increased share in the Cincinnati pool have been submitted.

There were 3.2 miles of second track and 4.7 miles of sidings added during the year. A number of new stations and other buildings have been erected.

President Jewett's report says: "The condition of the equipment of the road was such as to require excessive expenditures to put it in effective shape. During the year 4 new locomotives were purchased, 6 have been built at your shops, and 26 have received extensive general repairs. The cost of 4 of the new locomotives has been charged to equipment account. The cost of the 6 built and the extensive general repairs to the others has been charged to expenses. Fifteen new passenger cars have been purchased: ten have been charged to new equipment and five to repairs account, in addition to 10 rebuilt and others receiving extensive general repairs at your shops.

"Much work has been done during the year in substituting iron for wooden bridges, in replacing iron with steel rails, renewing ties and fastenings, and ballasting 25 miles of the main track. The double track between Lackland and Schencks, a distance of 11 miles, has been commenced and completed as far as Glendale. The remaining portion is in course of construction, and will be finished early in the coming year. When completed, this will give a continuous double track from Cincinnati to New River Junction, a distance of 28 miles.

"During the year another elevator of a capacity of 800,000 bushels has been completed at Toledo. This elevator was built by Mr. John Hurd, of Bridgeport, Conn., under a contract entered into with him in October, 1881, by Mr. J. H. Devereux, as President of this company. Under this contract Mr. Hurd was to furnish the money and build the elevator, rendering vouchers for the cost thereof. Upon its completion an elevator company was to be formed, the capital stock of which was to be equal to the cost of the elevator so built by Mr. Hurd, and the appraised value of this company's present Elevator A in Toledo. The Cincinnati, Hamilton & Dayton Co. was then to pay Mr. Hurd the difference between appraised value of Elevator A and half of the capital so determined, and they were then to become equal partners in their operation. This arrangement has been carried into effect, and in pursuance thereof your company has paid to Mr. Hurd during the year the sum of $69,218.15.

"During the year an arrangement has been entered into by your company with the other railroad lines reaching points on Lake Erie, by which the lumber traffic from those points is to be equitably divided among the different lines, and the rates thereon are to be maintained. This arrangement will be beneficial to all parties in interest."

Indiana, Bloomington & Western.

At the close of its last fiscal year, Dec. 31, 1882, this company worked the following lines:

	Miles.
Peoria Division, Indianapolis, Ind., to Pekin, Ill	202.5
" " Pekin to Peoria, leased	9.0
Middle Division, Indianapolis to Springfield, O	142.0
St. Louis Div. (Indianapolis, Decatur & Springfield), leased	152.5
Ohio Div. (Cincinnati, Sandusky & Cleveland), leased	190.0
Total	696.0

The Ohio Division has been leased from May 1, 1881, and the St. Louis Division from Jan. 1, 1882. The Middle Division was not completed until so near the end of the year that no mention is made of it in the accounts.

The general balance is as follows:

Stock		$10,000,000.00
Funded debt		13,637,300.00
Temporary loans		324,460.36
Accounts, pay-rolls, accrued interest, etc		546,310.47
Income account, balance		582,647.12
Total		25,090,717.95
Road and equipment	$24,519,782.04	
Materials on hand	280,543.52	
Accounts receivable	78,440.44	
Cash and cash items	211,951.95	
		$25,090,717.95.

The stock was increased by $1,859,600 during the year. The bonded debt was also increased during the year, the amount added being $4,925,000 in all.

The earnings for the year were as follows, the mileage worked being 554 miles in 1882, against an average of 338 miles in 1881:

	1882.	1881.	Inc. or Dec.	P. c.
Freight	$1,554,616	$1,049,784	I. $504,832	48.1
Passengers	924,726	592,565	I. 332,161	56.0
Mail and express	112,828	66,272	I. 44,556	65.5
Rents, etc	148,057	115,446	I. 32,611	28.3
Total	$2,740,227	$1,826,067	I. $914,160	50.1
Expenses	1,787,903	1,103,702	I. 684,201	62.0
Net earnings	$952,324	$722,365	I. $229,959	31.8
Gross earn. per mile	4,946	5,403	D. 457	8.5
Net " "	1,719	2,137	D. 418	19.5
Per cent. of expenses	67.25	60.44	I. 6.81	....

The expenses last year include about $157,000 for extraordinary renewals and improvements.

The income account was as follows:

Net earnings, as above		$952,324.15
Interest, etc	$391,410.60	
Rentals	575,770.83	
Other disbursements	28,456.24	
		995,637.67
Deficit for the year		$43,313.52
Surplus, Jan. 1, 1882		625,960.64
Surplus, Jan. 1, 1883		$582,647.12

The following expenditures were also made during the year for necessary improvements chargeable to property accounts: Right of way and real estate, $40,553.31; new work, construction and equipment, $576,712.77; a total addition of $617,266.08 to cost of property.

The report says: "In addition to the mileage operated in 1881, we operated during the year the Indianapolis, Decatur & Springfield Railway, extending from Indianapolis to Decatur. Owing to the delays resulting from long-continued unfavorable weather, the completion of our new line from Indianapolis to Springfield, Ohio, connecting our lines west of Indianapolis with our leased lines in Ohio, with the necessary side tracks, station-houses, water and coaling stations, etc., was prevented until nearly the close of the year. * * * The business on the new line is growing rapidly, and we find ourselves able to run fast through solid trains over the entire system, making prompt connections, and in the possession of a large and increasing traffic fully equal to all just estimates. While the business on all other divisions shows a satisfactory increase, the earnings of the Indianapolis, Decatur & Springfield Division fell considerably from the earnings reported by that company for the previous year. During the first half of the year this lease proved a considerable loss, but in the last six months the earnings largely increased, so that at the end of the year the net deficit from the lease amounted to $52,102. * * * In addition to ordinary operating expenses there are included in the subjoined statements of operating expenses very large extraordinary expenditures ($257,000) incurred in completing the plans adopted and carried forward in 1881 for the general improvement of the road and equipment."

Large expenditures were also incurred for new work including the acquisition of increased terminal facilites, the construction of side tracks, new docks, etc. These expenditures being for absolute additions to the property, are carried to account of construction and equipment.

At the close of the year 1881, 401 miles were in operation, but the Ohio Division, 190 miles, was acquired in May, 1881, and the earnings given include that division for the eight months only. In January, 1882, the Indianapolis, Decatur & Springfield (152 miles) became a part of this road, and during the year the new line (142 miles) was opened, though not ready for through business till near the close of the year.

RAILROAD GAZETTE

Published Every Friday.
CONDUCTED BY
S. WRIGHT DUNNING AND M. N. FORNEY.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

A STANDARD FREIGHT CAR.

At the recent convention of the Master Car-Builders' Association, on motion of Mr. Goodwin, of the Lehigh Valley Railroad, it was resolved that "a committee of seven be appointed representing the largest car-owning roads which send members or representatives to the Master Car-Builders' Association, said committee to confer together, and if possible agree upon a standard box car, with details of all parts. The maximum load of the car shall be 60,000 lbs." The committee was instructed to report to the Executive Committee of the Association, and the latter committee to lay its conclusions in the form of a report before the members of the Association, presumably before the next annual meeting, and to report to the Association next year. Probably very few of the members present when Mr. Goodwin's resolution was adopted recognized its significance and importance. For seventeen years the Car-Builders' Association has been holding its meetings, and has been making efforts to have certain forms and dimensions for the parts of cars adopted as standards. That the Association has done what it could or should have accomplished in the time and with the opportunities it has had since it was first organized perhaps few of its members would assert. Nevertheless, it has done a good deal, as any one will see who will examine the list of standards adopted by the Association, and which was published in the *Railroad Gazette* of Oct. 6 of last year, and also in the report of the adjourned meeting held at Niagara Falls. Some errors and discrepancies exist in the resolutions which were originally adopted, and in some cases it is not easy to determine exactly what the action of the Association was in relation to certain questions; but it has been made the special duty of a committee to codify and correct the record, and by next year it will probably be put into a more simple and definite form, so that the action of the Association will then be apparent at a glance. The standards which have been recommended are: a height of draw-bar, a system of screw-threads, a standard axle, journal-bearing, journal-box, and pedestal, dimensions for dead-blocks, position of brake-shafts and brake ratchets, dimensions of running boards, position and dimensions of steps, ladders and handles, and diameter of chill molds for cast-iron wheels.

Probably only a comparatively small proportion of master car-builders and railroad managers know what the action of the Association has been, but the same committee appointed to codify and correct the resolutions recommending standards for adoption, has also been instructed "to do all in their power to secure their adoption." It is therefore probable that the action of the Association will be brought to the notice of master car-builders and the managers of railroads in all parts of the country, and they will be urged to adopt what the Association has recommended. But even if they should do this there would still remain much which needs reform, and many parts of cars which still require to be reduced to standard forms and proportions, and concerning which the Association has thus far taken no action. The weakness of the Association before its reorganization, owing to the fact that it had no direct relations of a representative character with the railroad companies of the country, has heretofore been pointed out in these columns. Its members met together of their own accord, and generally paid their own expenses. They adopted resolutions and recommended certain action, of which railroad managers took very little notice, because they had no part or lot in what was done. Therefore in reorganizing the Association, the problem which presented itself was to bring it into such relations with the management of railroads that those in authority should be made to participate in its action, and thus acquire an interest in what was done by it. This was to some extent accomplished when representative members, appointed by the managers of the railroads, were admitted under the new constitution, with a vote on some questions proportionate to the number of cars owned by their companies. This had the effect at once to convert the Association into a representative body, and the three largest systems of railroads, or rather the three systems which own the largest number of cars, at once appointed representatives.

It has often been remarked that if the representatives of a half-dozen of the largest trunk-lines should meet together and agree upon a standard freight car, and if all of these lines should adopt it, all the other roads would be compelled to follow their example, and that this would probably be the most effective way to secure uniformity in freight-car construction. To this plan it has been objected that it is by no means certain that the master car-builders or other representatives of the great lines would be the best judges of the merits of any given plans; that, at any rate, before such plans were adopted they should be criticised and discussed by the representatives of the smaller lines, and that they should have a voice in their adoption or recommendation.

Now, if any one, with these considerations in mind, will regard the resolution of Mr. Goodwin, they will recognize at once how effective it is likely to be in accomplishing what the Car-Builders' Association has been struggling for sixteen or seventeen years to do, with only a very fractional degree of success. The reorganization of the Association has given it the required representative character to deal effectively with the problem of a standard freight car. This accomplished it is necessary only to secure the desired co-operation of the representatives of "the largest car-owning roads" with a view to agree upon a standard box car. This done their plans are then to be submitted to the Executive Committee and to the Association for criticism, discussion and final adoption. If then this committee has the ability, skill, knowledge and experience, and will devote sufficient time, labor and thought to the work assigned to it, there is no good reason why "a standard box car with details of all parts" may not be adopted or recommended within a year from the present time. This would certainly be an immense step in advance over what has heretofore been accomplished by the Association, and it is quite safe to say that if the work is done even moderately well it will be of immense value to railroad companies.

It is of course very desirable that those undertaking this work should appreciate the nature of the problem so as to look far enough in advance of present practice to meet the requirements which will be demanded of the rolling-stock of the future. There can be no question of the radical defects of the freight-car trucks at present in use. The lubricating appliances are rude and imperfect, and the general design and construction of the trucks indicate a most lamentable lack of knowledge of the principles and practice of mechanical design. The draw-gear in use on most cars requires some radical changes to fit it for service with the heavy cars of the present day. The brake-gear should be arranged so as to be readily adapted to continuous brake apparatus, and its design and construction ought to be of a much more substantial character than they have been usually. The appliances for the protection and safety of trainmen are most lamentably defective and insufficient, and the framing of freight cars seems never to have advanced much beyond the rule-of-thumb state of development. All these questions the committee will be called upon to consider and investigate, and it will be compelled to decide many difficult and perplexing questions. Of course, any one appreciating the nature of the work will realize at once that it will be impossible to do it without the expenditure of much time and the exercise of great industry and patience, and that it will require mechanical ability of a very high order to devise plans which will be in every way satisfactory.

The Importance of the Corn Crop.

The Department of Agriculture reports now its first estimate of the acreage of corn, making it 68 million acres for the whole United States and 2¼ millions (3.8 per cent.) more than last year. With an average yield this increase in acreage alone would produce about 62 millions of bushels. The condition July 1 is given as 85 for the whole country as against 88 at the same time last year, 90 in 1881, and 100 in 1880. At this early date there is room for great changes in corn, as may be judged by the fact that with a condition of 90 July 1, 1881, the crops turned out to be 1,195 millions of bushels, while with the condition of 85 last year it was 1,617 millions from an acreage but 2¼ per cent. greater. The difference in condition would make the crop 50 millions more than last year; so that it may said that the prospect July 1, according to the Department of Agriculture, was for a crop of about 1,730 millions, which has been exceeded only in 1879, when there were 1,755 millions, but from an acreage one twelfth smaller. But we can hardly speak of a "prospect" for corn as early as July 1, when, if it is fairly out of the ground, almost everything is possible for it. And so far the July weather has been favorable for corn at a most important time, for it could hardly wait any longer for good growing weather, while last year the first week of July was extremely unfavorable. Therefore, since the Department's report was made the difference in condition in favor of this year must have increased, and an increase in 1 per cent. in the condition of this crop makes an increase of about 17 millions in the production. If we do not have early frosts we may very likely have a larger crop of corn this year than ever before—1,800 millions is easily attainable with favorable weather, and with the average yield of 1879 (which was unusually large), the crop would be 1,900 bushels. It is very improbable, however, that with the bad start this crop has had in the great corn states it will give an average yield as great as in 1879, the more so because the chief increase in acreage has been in the states which have had the worst corn weather.

The value of this crop to the country is not sufficiently appreciated. It is usually worth more in money than all the other grain crops put together, and a failure of it like that of 1881, which was 522 millions (30 per cent.) less than that of 1880, has an effect which lasts for some years. At the beginning of this year the number of hogs in the country was 3,400,000 (7 per cent.) *less* than 2½ years before, notwithstanding a great general growth of the country, including an increase in population of nearly 10 per cent. This was probably wholly due to the short corn crop of 1881. The number of hogs packed since February has been very much less than in 1881 and some previous years, so that the effect still lasts; and though as this animal breeds very fast we may expect a great increase in the number for winter packing (after October), if there is plenty of corn, there will probably be much fewer even then than the 7,480,000 packed in this season in 1878–79, the 6,950,000, and 6,919,000 in the two following years, which fell to 5,748,000 in 1881–82, and the 5,855,000 last winter. These changes have a great effect on farmers, merchants and carriers, and on our export trade, and indispensable to a recovery is a good corn crop.

The effect of the poor crop, however, is much greater on some parts of the country and on some railroads than on others. In fact, the chief effect has been on a somewhat limited district, and especially last year. It might be thought that too much stress has been placed on the decrease last year from 1880, which was but 6 per cent. But in fact, in the two chief corn-growing states, Illinois and Iowa, the yield in 1882 was very little more than in 1881, and was 143 millions less than in 1880 and 243 millions less than in 1879—a tremendous decrease to be suffered by two states and their railroads, these states having less than one-tenth of the population of the country. Their production was about 132 bushels per head of population in 1879, but only 70 bushels in 1881 and 1882, and this in by far the most important crop of these states, while in 1881 there was also a great decrease in their

wheat crops, and in 1882 much less than in 1880 and less than in 1879.

There are seven states west of Pennsylvania which form the "corn belt," producing sometimes two-thirds of all the corn raised in the United States, and being the only states which export corn to any extent, while by far the larger part of the hogs packed for market are grown there. These states are Ohio, Indiana, Illinois, Iowa, Missouri, Kansas and Nebraska. Their acreage, production and average yield per acre of corn for the last four years have been:

	1879.	1880.	1881.	1882.
Acres....	33,202,500	33,492,400	34,594,800	33,515,000
Production, bu.	1,201,841,000	1,046,004,000	737,759,000	955,596,000
Yield per acre ..	35.2	31.2	21.3	28.4

There was very little change in the acreage in these four years, which was just about one-half of the total corn acreage of the country; but the production one year was 464 millions (60 per cent.) more than in another.

The increase in 1882 over 1881 was very little in Illinois and Iowa, but enormous in Missouri, Kansas and Nebraska. Taking Illinois and Iowa together, the acreage and production have been:

	1879.	1880.	1881.	1882.
Acres	15,635,500	15,687,400	15,806,800	14,691,344
Bus produced.	600,816,700	500,645,100	350,022,000	357,824,000
Bus. per acre..	38.4	31.9	22.2	24.4

These two states in 1881 produced 250 millions (41 per cent.) less than in 1879, though their acreage was a little greater; in 1882, they with 6 per cent. less acreage than in 1879, thus produced 243 millions (40 per cent.) less They have this year, according to imperfect state reports, about 15,500,000 acres, or nearly as much as in 1879. A yield of 35 bushels an acre in them, therefore, would give them 542½ million bushels of corn, which is 185 millions more than last year. This would make up twice over for any possible decrease in wheat production in these states, and be of very great advantage to the railroads which traverse them, and which have now for two years suffered greatly because of the light corn crop. Among the railroads which would be most benefited by a good yield of corn are the Wabash, which very much needs such benefit, the Rock Island, the Chicago, Burlington & Quincy, the Northwestern, and, generally, the railroads in Illinois and Iowa, where the production has been so small for two years, and to considerable extent the roads east of them. The roads in other states would profit less only because they have suffered less.

We have not yet the estimate of the United States Department of Agriculture for corn acreage in the separate states this year, but the Iowa State Agricultural Society reports an increase in that state of 8 per cent. in acreage, while the condition is given as 6 per cent. better than earlier in the season, and the Department at Washington made it 80 in Iowa July 1 and 82 in Illinois, where local authorities estimate the increase in acreage as 3 per cent. These are low conditions, but probably a little better than last year, while there has been great improvement since, when there was little or none last year. With the average very poor yield of last year (25.9 bushels per acre) this would give a production of 190 millions in Iowa, while with the yield of 1880 it would give 278 millions, and with that of 1879 no less than 303 millions. With such a difference between a good and a bad yield in a single state, it is no wonder that the crop prospects are eagerly canvassed. Though the condition there now must promise better than last year, it is hardly possible that the yield per acre should be as large as in 1880, unless we have extraordinarily favorable weather hereafter, including a September without frost. But a yield of 30 bushels per acre would give 44 millions more than last year and 46 more than in 1881, and a yield of 35 bushels would give 80 millions more than last year, and this is at least possible. The increased acreage in Illinois with a yield of 30 bushels per acre would produce 242 millions, and with a yield of 35 bushels 285 millions, against 182 millions last year; and with its very poor wheat crop (estimated by the Department of Agriculture as 26 millions and by the state authorities as 36 millions less than last year, when it was 52 millions), a good corn crop is much needed by Illinois and the Illinois railroads.

Chicago Shipments to the East.

Through Chicago rail shipments eastward for the nine days ending June 30, by the six pooling lines were 40,958 tons, or at the rate of 30,718 tons in a week. Of these the Chicago & Grand Trunk carried 16.4 per cent., the Michigan Central 17.4, the Lake Shore 18, the Fort Wayne 23, the Chicago, St. Louis & Pittsburgh 18.1, and the Baltimore & Ohio 7.1 per cent. Thus the two Vanderbilt roads carried 35.4 per cent. of the whole, instead of their allowance of 45.5; and the two Pennsylvania roads carried 41.1, instead of 35.5.

For four successive years the shipments of the last week of June have been:

	1880.	1881.	1882.	1883
Tons	46,995	67,953	24,286	30,718

Thus the shipments this year, though 6,432 tons (27 per cent.) more than last year, were 37,235 tons (55 per cent.) less than in 1881 (the second week of the railroad war) and 16,277 (34½ per cent.) less than in 1882, when rates were higher than this year.

For seven successive weeks the Chicago shipments have been, in tons:

Week ending—						
May 14.	May 21.	May 31.	June 7.	June 14.	June 21.	June 30.
36,270	26,677	25,054	26,093	29,399	27,449	30,718

Thus the receipts of the last week of June were the largest for six weeks, though they were decidedly small.

For the month of June the Chicago shipments have been for five successive years, in tons:

1879.	1880.	1881.	1882.	1883.
260,234	223,977	242,463	115,805	123,899

The shipments this year were decidedly disappointing, only 7 per cent. more than last year, little more than half as great as in 1881, 45 per cent. less than in 1880, and not half as great as in 1879. It must be remembered, however, that the shipments of the two new railroads are not given this year. About 14,000 tons went by these two roads, one of which received freight but part of the month. It is not easy to understand why the shipments should have been so small. They were small from other Western points and small by lake, though there is probably four or five times as much grain in the West as last year at this time, and more provisions—these making by far the larger part of the Chicago shipments.

The shipments each month in the first half of the year for five successive years have been:

	1879.	1880.	1881.	1882.	1883.
January...	192,512	163,378	263,872	321,148	257,093
February..	198,541	166,541	204,331	225,816	223,212
March	258,458	318,983	212,021	179,145	287,563
April.....	298,042	186,543	275,417	138,472	147,129
May	280,355	125,157	171,432	115,772	141,011
June.... .	260,234	223,977	242,463	115,805	123,889
Six mos .	1,488,142	1,184,579	1,369,536	1,095,729	1,179,897

The difference between the first and second quarters of the year is striking, the shipments in each having been:

	1879.	1880.	1881.	1882.	1883.
Jan. to March.....	649,511	648,902	680,224	726,127	767,868
April to June.....	838,631	535,677	689,312	369,602	412,029

Thus in the first quarter of the year the shipments this year were greater than ever before, though the rates were on the average probably nearly twice as high as last year, and much higher than in 1879, when they were badly demoralized in both quarters. But in the second quarter, the shipments were but 42,427 tons (11 per cent.) more than last year, when the West had very little grain to spare; 277,000 tons (40 per cent.) less than in 1881, when there had been but two weeks of open railroad war and for the whole quarter the rates must have averaged very nearly as much as this year; 23 per cent. less than in 1880, when the rate was a fifth higher; and not half as great as in 1879, when rates were very badly demoralized.

When navigation opens about May 1, as in most years, rail shipments usually are very light throughout May, if rates are maintained; but they usually recover in June, and we confidently expected that they would this year. The course from May to June has been downward, on the contrary, and the June shipments are smaller than in any other month in the fifty-four here reported, except May, June and July of last year—the end of the worst crop-year of recent times. So far as grain is concerned, the condition of the markets has been almost the reverse of last year, resulting, however, in a very similar grain movement. That is, last year there was a sharp demand at high prices, but a very light supply in the West, so that in the last three or four months of the crop-year the shipments were exceptionally light; this year there is plenty of grain (especially wheat) in the West, but the world is full of grain, and makes but light drafts on the country which markets grain by way of Chicago. Last year the light movement was due to a short Western supply; this year, to a light Eastern demand.

July closes the crop-year, speaking generally, but for several years past there have been large shipments of new winter wheat in July from the country south of the latitude of Indianapolis. It is doubtful whether the movement of wheat will be large this year, whatever be the crop, because there is but a light demand, and farmers will not be in a hurry to market their grain when the price is very low, and these shipments will not greatly effect the Chicago business, because it is far to the north of the country where the new wheat is being harvested, though it gets a large share of the Kansas wheat. But if the prospects of the corn crop continue to improve, we may yet have a decided increase in the movement of corn, which will be felt chiefly at Chicago.

The incomplete report from Chicago of the eastward shipments, through and local, for the week ending July 7, gives them as 21,037 tons this year, against 13,233 in the corresponding week of last year, and 32,244 in the previous week of this year. Of the shipments last week the Nickel Plate took 1,130, and the Chicago & Atlantic 3,539 tons—the latter more than any other road but the Lake Shore, while the Fort Wayne, which had led for so long, stood fourth on the list, the tons by each being:

G. T.	M. C.	L. S.	Ft. W.	C., St. L. & P.	B & O.	N. Y. C.& St.L.	C.& At.
2,909	2,566	3,973	2,695	3,435	700	1,130	3,539

Thus the two roads outside of the pool carried 4,669 tons, which is 22¼ per cent. of the whole reported. The complete statement may vary considerably from this, however.

Defending the Baltimore & Ohio.

The Baltimore & Ohio's line to New York seems to be regarded unfavorably by some of the Baltimore people, and articles and interviews have been published which indicate that they think the ownership of a line to Philadelphia will make the Baltimore & Ohio less a Baltimore road—more inclined to cultivate shipments to and from Philadelphia and New York than to and from Baltimore — while there are other complaints against the company for neglecting to cultivate Baltimore interests. In a long interview, a report of which was published last Monday, Mr. Robert Garrett meets these complaints. He says, and truly, that the Baltimore & Ohio is not likely to neglect the traffic of Baltimore, which it gets the most of, for that of Philadelphia or New York, which it must share with several other roads. And he points out that the possession of a line of its own cannot make it less to its interest to have a difference of rates in favor of Baltimore: with the difference abolished it would get no pay for the use of the new line for through traffic, and certainly it could not prefer to carry freight a hundred miles further without any additional pay. But he says that his company has heretofore only succeeded in maintaining a difference of rates by fighting for it, and that in order to fight effectively a railroad must be able to reach traffic centres where its rival has an important traffic, as it is the amount of traffic made profitless by low rates which is the effective force of a railroad war. Heretofore the Baltimore & Ohio has sometimes been compelled to put on a steamer line between New York and Baltimore to enable it to reach New York traffic, and thus strike at the supplies, as it were, of the enemy. With a road of its own it will be able to compete effectively, even if all the other roads should be opposed to it. Then, Mr. Garrett says, if the questions of differences is again mooted, "the Baltimore & Ohio Company would demand, and be in a position to enforce a demand, that the differentials should be larger than they are at present." It can be no injury to Baltimore for the Baltimore & Ohio to carry New York and Philadelphia freight. If it does not take it other roads will, and Baltimore would not get it, and as the service is and will be done for Baltimore cheaper than for any other place, it will have no reason to complain.

Mr. Garrett wisely cites the Pennsylvania Railroad as an example of road with a terminus at New York which none the less cultivates the traffic of another city, and insists on a difference in rates in favor of Philadelphia. He might have mentioned the fact (but did not) that it also cultivates the business of Baltimore, and in one year at least brought more grain to that city than the Baltimore & Ohio itself. He cites the costly improvements recently made in Philadelphia by the Pennsylvania—the elevated railroad and the new passenger station—as evidence that the possession of a New York terminus does not lead a company to neglect another seaboard terminus.

The people who complain of the Baltimore & Ohio's building for a small sum an extension to Philadelphia, says Mr. Garrett, are, many of them, the same who found fault with it for letting the Pennsylvania get the Philadelphia, Wilmington & Baltimore not long ago at a high price. He does not see why that Philadelphia connection should have been desired and the one under construction denounced.

One of the complaints is that the Philadelphia line will not pay. Mr. Garrett says that some time ago, when there was talk of building it, many of the best business men of Philadelphia and other cities offered to build it, and Mr. Wm. H. Vanderbilt offered to furnish the money for it. It will have, as soon as completed, all the Baltimore & Ohio's traffic to and from Philadelphia and New York, and will have a part of the shipments of these two places and of the anthracite going to Baltimore. He says it should have a largely increased share of the Philadelphia and New York shipments, and asks why it should not have at least 25 per cent. of their shipments to Cincinnati, St. Louis and the Southwest, to which it is a short route. (Lest it may be feared that this portends a disruption of the trunk line pool, we hasten to say that 25 per cent. of the shipments to Cincinnati from New York amounts to about 1⅓ per cent. of the total New York shipments, and 25 per cent. of the shipments to St. Louis to still less, and the total *addition* to its share which would result from giving it the 25 per cent. here suggested would be equal to about 2⅔ per cent. of the New York shipments.) The line also, says Mr. Garrett, will command a large share

of the travel between New York and Washington and the South.

With regard to giving up the scheme for a system of Southern connections, Mr. Garrett says that such a system would feed but forty miles of his road, and manifestly could not be justified as a feeder of it. When the Baltimore & Ohio sold the Virginia Midland, at a profit, however, it made the purchasers agree not to discriminate against Baltimore. When afterward there was an opportunity to purchase the road and a connecting Southern system, the Baltimore & Ohio Company called the attention of Baltimore merchants to it, and persons connected with the railroad company offered to subscribe largely. But not a single subscription was received from the merchants.

The complaints of the Baltimore men, so far as they relate to the railroad's seeking a second and a third seaboard terminus, are doubtless idle and narrow. It may be true that the Baltimore & Ohio hereafter will not consider the nterests of Baltimore so exclusively as it may have done heretofore. But a railroad should be a *common* carrier, and not simply a tender to some one market. The more a system grows the more important it becomes for it to reach *all* the important traffic centres near it. On the 2,000 miles of road owned or controlled by the Baltimore & Ohio, extending from Baltimore to Cincinnati, Louisville, St. Louis and Chicago, there must be a large tonnage and number of passengers that under any circumstances will go to New York, and will not go to Baltimore. It is greatly to the railroad's advantage that it should be prepared to carry all this traffic. The New York Central and the Erie found this out some years ago, and the former put on a freight line to Philadelphia and Baltimore, and the latter to both places. If in any degree a railroad is made less provincial by this, by so much is it made more national.

Chicago Carriers.

Chicago railroad traffic, as shown by the Board of Trade report of 1882, has some notable features probably not generally suspected. For instance, we might naturally suppose that its chief supply of pig iron, and even of manufactured iron, would be brought by the Pittsburgh, Fort Wayne & Chicago road, or that it would bring more than any other road. But the report shows that the Lake Shore led in both of these, delivering at Chicago 40 per cent. of its receipts of pig iron and 36.2 of manufactured iron, while the Fort Wayne brought but 16 per cent. of the pig iron and 21.1 of the manufactured iron. The roads from the East are not by any means the only ones that bring pig iron to that city. On the contrary, about 27 per cent. of its rail supply (65,621 tons) came in 1882 over the roads from the West—from the same roads that bring it grain and stock. The Chicago, St. Louis & Pittsburgh, which as a Pittsburgh road might be expected to carry a great deal of iron, brought Chicago less manufactured iron than the Chicago & Grand Trunk or the Michigan Central, and less than 6 per cent. of its rail supply, and less pig iron than the Illinois Central or the Chicago & Eastern Illinois, and not a quarter as much as the Chicago & Northwestern, and less than three per cent. of the whole arriving by rail.

Perhaps more surprising are the small iron receipts by lake. Many of the lake towns are quite extensively engaged in iron manufacture, and a great many works are closely connected with the lake by canal or rail, and for pig iron especially it might be supposed that the lake would be the favorite route. But the actual arrivals in 1882 were 32,981 tons of manufactured iron by lake, against 575,253 by rail; and 35,765 tons of pig by lake, against 238,037 by rail.

Another striking fact is the very large proportion of the receipts of certain great staples carried by a single railroad. For instance, of the 4,177,912 barrels of flour received in 1882, the Chicago, Milwaukee & St. Paul brought 37.5 per cent. and the Chicago & Northwestern 32.7—an indication of the importance of the shipments of the Minneapolis and other Minnesota mills. The Rock Island has recently had a share of this traffic, and in 1882 it brought 10.6 per cent. of the Chicago receipts. Thus these three railroads brought 80.6 per cent. of all the Chicago flour receipts. No other road brought as much as 6 per cent. Yet these were not the chief carriers of wheat to Chicago—were not in 1882. In wheat the Chicago, Burlington & Quincy led, bringing 28.8 per cent. of the whole, while the Northwestern brought but 13.9 per cent. and the Milwaukee & St. Paul 5.8. It is to be said, however, that these roads (especially the latter) deliver wheat at Milwaukee, which is forwarded thence by lake. Not much flour goes by lake, and most of what they carry to Milwaukee they carry also to Chicago on its way to the East. Last year the Wabash brought more wheat to Chicago (14.1 per cent. of the whole) than any other railroad except the Burlington, and the Chicago & Alton with 12.4 per cent., and the Rock Island, with 11.7, were close behind the Northwestern, and brought twice as much as the Milwaukee & St. Paul.

The Chicago, Burlington & Quincy not only brought to Chicago more wheat than any other road, but more corn (28¾ per cent. of the whole), more cattle (31 per cent.), more sheep (26¾ per cent.), more hogs (26¾ per cent.), more wool (35.2 per cent.), and even more cotton, of which unimportant freight (for Chicago) it brought no less than 76.3 per cent., while the Chicago & Alton is credited with nearly all the rest (22.4 per cent.). The shipments of lumber by the Burlington were also more than by any other road, and just one-third of the total Chicago shipments, the lines which stood next being the Chicago & Alton, and the Wabash, each with 10.9 per cent.

The Chicago & Northwestern led in oats, bringing Chicago 21¾ per cent. of its supply, with the Burlington close behind, with 20⅜ per cent. The Chicago & Alton brought more than twice as much coal to Chicago as any other railroad, and 24 per cent. of its whole supply, and probably nearly twice as much Illinois coal as all other railroads together. Lake vessels brought only a little more than the Chicago & Alton (25.3 per cent.), more than two-thirds of which was anthracite. Next to the Chicago & Alton among railroads was the Pan-Handle, which brought just 10 per cent. of the whole, and the Chicago & Eastern Illinois, with 9.8 per cent. The latter brings the block coal of Indiana, but also large amounts of Illinois coal. The roads to the East, which not many years brought very little coal, except from Pittsburgh, last year brought more than 34 per cent. of the whole, and one-third more than the lake vessels.

Northwestern Grain Receipts.

For the six months ending with June, the receipts of grain of all kinds at the eight Northwestern markets have been, for four successive years:

	1880.	1881.	1882.	1883.
Chicago	54,515,803	46,792,530	36,350,504	54,056,039
Milwaukee	7,527,492	8,083,808	7,775,550	9,578,700
Toledo	14,327,457	11,696,850	6,219,896	9,135,278
Detroit	3,875,749	3,661,996	3,154,026	4,947,284
Cleveland	2,328,801	2,288,736	1,490,429	2,051,224
St. Louis	21,797,383	21,336,218	15,780,249	20,493,985
Peoria	10,885,165	13,111,830	11,024,130	10,391,540
Duluth	1,021,542	165,034	571,975	1,076,411
Total	116,279,392	107,137,000	82,366,849	111,730,461

Last year was so abnormal, because of the small surplus to be marketed, that a comparison with it has little value. Yet the full effect of the small corn crop was not felt till the last half of the year. In the first half 13,500,000 bushels less corn than the year before were received at these markets; in the last half the decrease in this grain was 29,000,000 bushels. It is not surprising, then, that there has been a large gain this year over last, amounting to 29,364,000 bushels (35⅜ per cent.) in the aggregate, and that the increase has been general, Peoria alone showing a decrease (5¾ per cent.). Of this entire gain of 29,364,000 bushels 17,700,000 was at Chicago, 4,713,000 at St. Louis and 2,915,000 at Toledo. Chicago received nearly as much as in 1880, when the aggregate receipts were 4,500,000 bushels (4 per cent.) greater, and Milwaukee received 1,950,000 bushels (26 per cent.) more than in that year; but Toledo received 5,192,000 bushels (36 per cent.) less, and St. Louis 1,303,000 (6 per cent.) less. The change at Toledo is an important one. In 1880 it stood third among the grain-receiving markets of the West; in 1881 it took the fourth place, Peoria having passed it; in 1882 it was fifth, Milwaukee going ahead; and this place it keeps this year, though it has considerably lessened the distance between it and both Peoria and Milwaukee. A heavy corn crop would probably do more than anything else to bring up the Toledo receipts, though it will probably never command so large a proportion of the grain shipments of the country southwest of it as it used to do. It is somewhat remarkable that since the Wabash, Toledo's great railroad, has vastly increased its mileage, Toledo's grain receipts have fallen off. It now, however, delivers grain at St. Louis, Peoria, Chicago and Detroit, as well as at Toledo. In 1882, it carried to Chicago 6,204,000 bushels; the total receipts at Toledo being 21,485,000.

The percentage of the total Northwestern receipts going to each market has been:

Distribution of Northwestern Receipts in the Half-Year ending with June for Four Years. Percentage of Total Receipts at Each Market.

	1880.	1881.	1882.	1883.
Chicago	46.9	43.7	44.1	48.4
Milwaukee	6.5	7.5	9.4	8.6
Toledo	12.3	10.9	7.6	8.2
Detroit	3.3	3.4	3.8	4.4
Cleveland	2.0	2.1	1.8	1.8
St. Louis	18.7	20.0	19.2	18.3
Peoria	9.4	12.2	13.2	9.3
Duluth	0.9	0.2	0.7	1.0
Total	100.0	100.0	100.0	100.0

Considering the fluctuations in the harvests of different localities and the opening of new grain-growing territory tributary to some of these markets and not to others, the fluctuations here shown in the percentages of receipts are remarkably small. Chicago has a little larger proportion this year than in any of the three preceding; St. Louis a little smaller one. Chicago and Milwaukee together have received from 51.2 per cent. of the whole (1881) to 57 per cent. (this year); St. Louis and Peoria together from 27.6 per cent. (this year) to 32.4 (last year). Toledo gains a little over last year, but shows a notable decline from 1880 and 1881. Detroit's gain does not make up for it, the aggregate percentage these two eastern termini of the Wabash road for the four years successively having been 15.6, 14.3, 11.4 and 12.6 per cent.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Atlantic Highlands & New York.—Completed from Atlantic Highlands, N. J., west to near Red Bank, 5 miles.

Bellaire, Zanesville & Cincinnati.—Extended from Louisville, O., west to Danford, 7 miles; also, on the western end, extended east to Duncan's Falls, 5 miles. Gauge, 3 ft.

Catskill Mountain.—Extended from Mountain House, N. Y., to Palenville, 2 miles. Gauge, 3 ft.

Chester & Lenoir.—Extended from Mayden, N. C., north to Newton, 12 miles. Gauge, 3 ft.

Chicago & Northwestern.—The *Sac City Branch* is extended from Holstein, Ia., west to Correctionville, 11 miles. The *Eagle Grove & Sioux Rapids* line is extended from Hawarden, Ia., west to Centreville, Dak., 25 miles; also from Iroquois, Dak., south 14 miles.

Cincinnati & Eastern.—Extended from Barden, O., east to Ottawa, 4 miles.

Georgia Pacific.—Extended east to a point thirteen miles from Birmingham, Ala., an extension of 8 miles; also extended west to Coosa Crossing, Ala., 3 miles.

Kaaterskill.—Completed from Tannersville Junction, N. Y., to the Hotel Kaaterskill, 8 miles. Gauge, 3 ft.

Litchfield, Carrollton & Western.—Completed from Carrollton, Ill., eastward to Greenfield, 12 miles.

Louisville, New Orleans & Texas.—Track is reported laid from New Orleans, La., north 45 miles; from Port Gibson, Miss., north to Vicksburg, 28 miles, and from Yazoo Crossing, Miss., north 20 miles.

Maryland Central.—Extended from Fallston, Md., northeast to Belair, 6 miles. Gauge, 3 ft.

Northern Pacific.—On the *Yellowstone Park Branch* track is laid from Livingston, Mon., south 5 miles.

Pittsburgh, Cleveland & Toledo.—Track laid from Akron, O., east to Kent, 11 miles; also from New Castle Junction, Pa., west to Carbon, 8 miles.

Union Pacific.—Track on the *Oregon Short Line* is laid to a point sixty-seven miles west of Shoshone Junction, Idaho, an extension of 30½ miles.

Valley, of Virginia.—Extended from Staunton, Va., southward to Greenville, 12½ miles.

This is a total of 282 miles of new railroad, making 2,391 miles thus far this year, against 4,758 miles reported at the corresponding time in 1882, 2,418 miles in 1881, 2,228 miles in 1880, 1,035 miles in 1879, 791 miles in 1878, 710 miles in 1877, 846 miles in 1876, 457 miles in 1875, 727 miles in 1874, and 1,587 miles in 1873.

THE CANAL GRAIN SHIPMENTS FROM BUFFALO from the opening of navigation till the end of June for the last four years, the number of days that the canal was open, and the average daily shipments have been:

	1880.	1881.	1882.	1883.
Bushels shipped	23,014,640	9,076,359	9,128,907	12,490,825
Days of open canal	72	45	81	56
Av. daily shipments	319,642	201,697	112,702	227,106

Thus the average shipments per day have been nearly twice as great as last year, when, however, the total movement to the east was extraordinarily small, 13 per cent. more than in 1881, and 29 per cent. less than in 1880. The success of the canal in competing for grain, however, cannot be judged by the absolute amount carried by it, but rather by the proportion of the grain going to the seaboard which goes by this route. Now the total Atlantic receipts for the periods here named have been:

	1880.	1881.	1882.	1883.
Bushels	65,604,087	42,185,963	27,640,311	30,515,303
Per day	911,168	937,466	341,237	554,823

Now, if we compare the canal shipments with the Atlantic receipts, we will find that these shipments were the following percentages of them:

1880.	1881.	1882.	1883.
35.1	21.5	33.0	40.9

Thus, though the canal shipments have not been large in amount, they have been an unusually large proportion of the total movement to the seaboard, and this notwithstanding the fact that the exports this year have been unusually small, while it is the export grain that the canals can usually compete for most effectively. The theory that the shipments have been greatly increased by the abolition of tolls, however, is opposed by the fact that the rates charged for carrying grain were as high this year as last, or in 1881, at this time, and by the further fact that in 1880, when the canal shipments were so much larger, the canal rates were at least one-third higher. It is, however, possible that the low rates heretofore have helped to reduce the canal shipments, because the boatmen, not being able to make any profit then, refused to carry and tied up their boats, whereas with the tolls abolished they can make a profit now at the same rates.

It is not easy to see, however, what interest other than the boat owners has profited by the proportionally heavier canal movement.

It is true that a little larger proportion of the grain has gone to New York since the canal opened than in years previous to 1882, but a much smaller one than in 1882. In June this percentage has been, for six years:

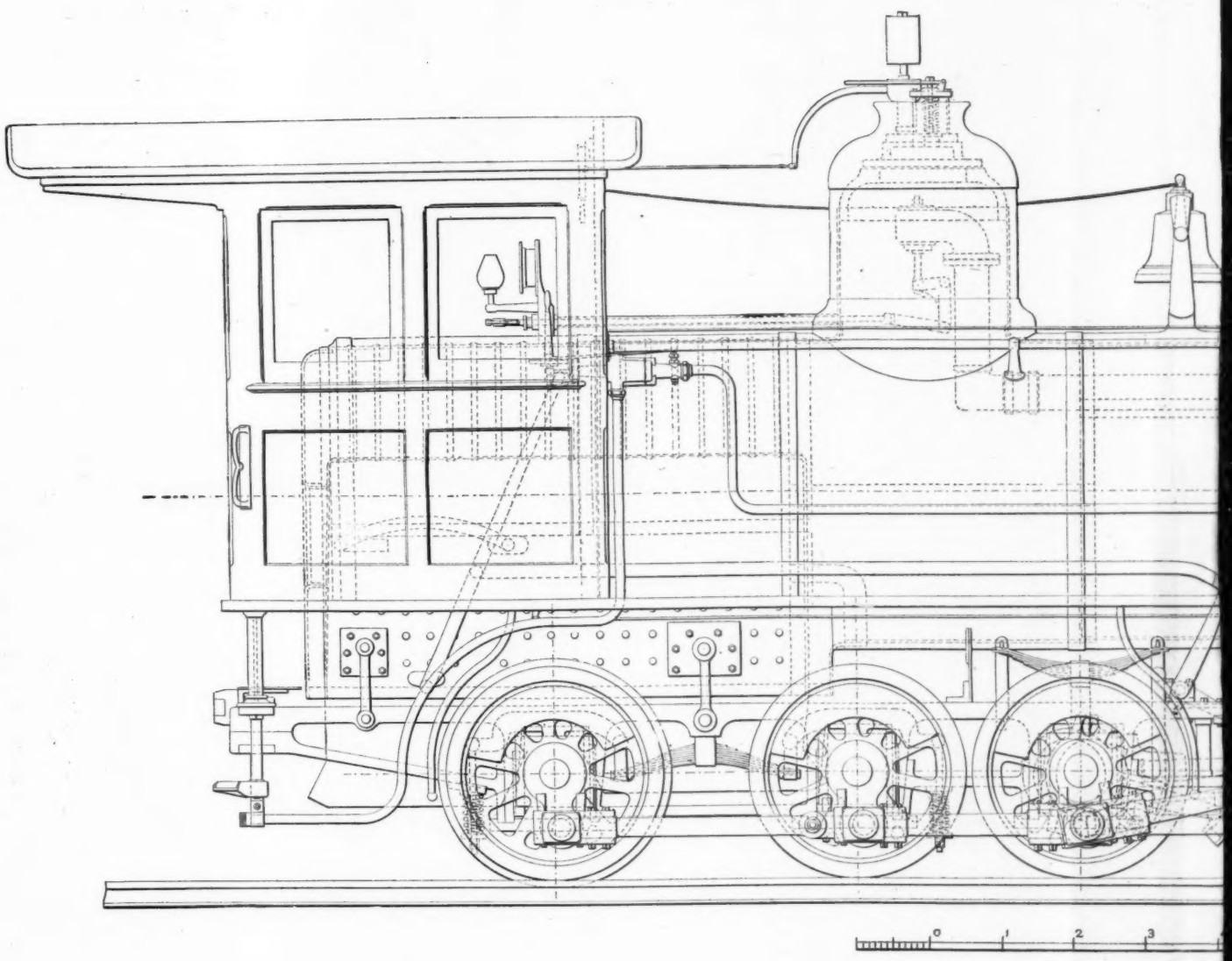
1878.	1879.	1880.	1881.	1882.	1883.
47.8	46.6	49.4	47.5	67.8	52.5

But New York always must take the largest proportion of grain when exports are small, because it consumes much more than the other places. This was the reason why it received so very large a proportion of the grain last year. We exported very little then. Now we are exporting more, but very much less than in the years previous to 1882. This, of itself, is sufficient to account for the increase in New York's percentage, though it is possible that the abolition of tolls had something to do with it, by inducing boatmen to take cargoes at rates so low that they would not have run their boats if they had had to pay tolls. In amount, New York's receipts were not large last June. Comparing them with previous Junes we have:

1879.	1880.	1881.	1882.	1883.
11,421,983	20,710,680	14,983,199	8,844,727	9,969,197

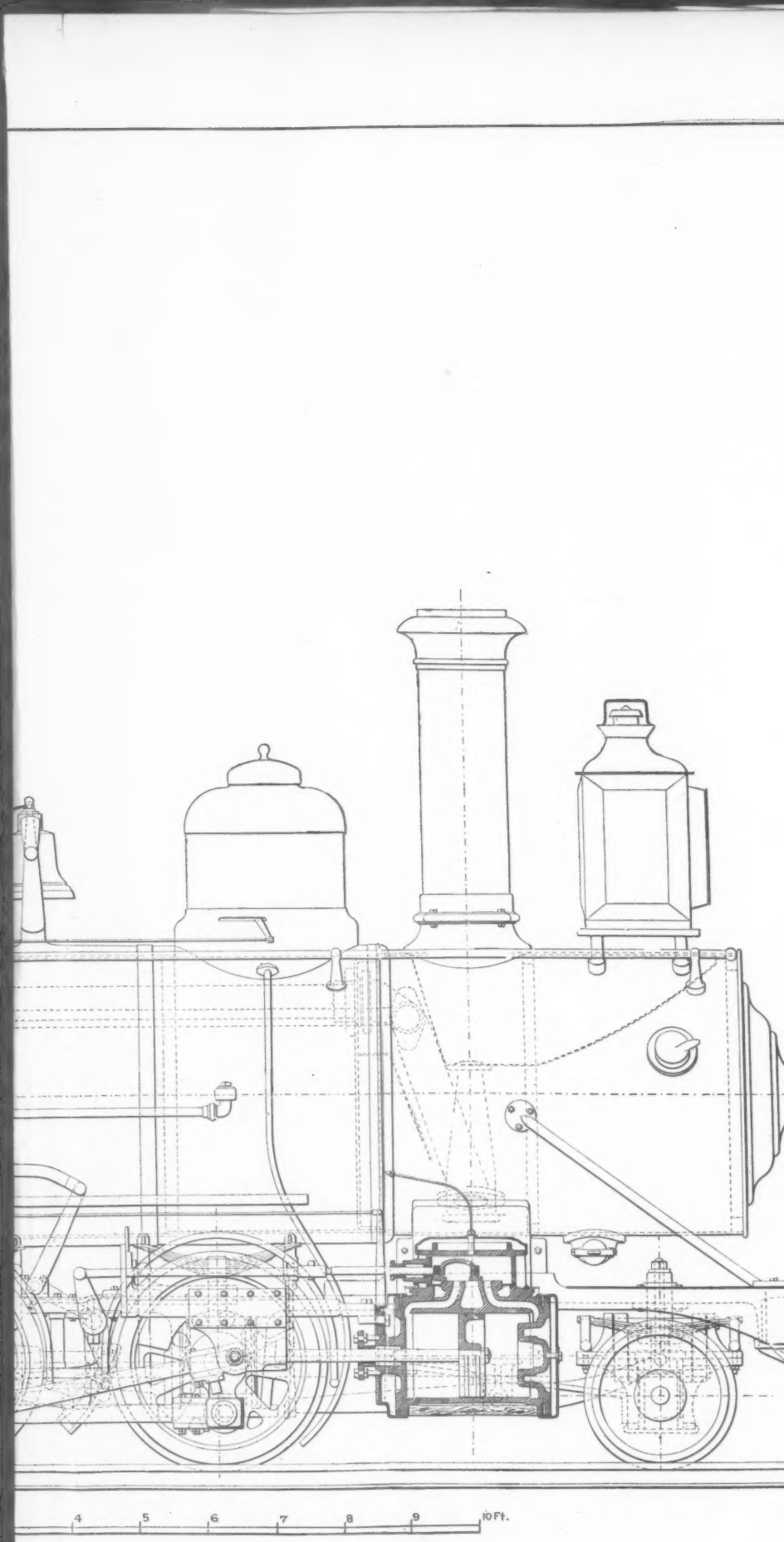
Thus, with the exception of last year, they were the smallest since 1878, and they were only one-eighth more than last year. As the receipts have fallen off in a similar way at other ports also, this is not especially significant, however.

THE PRODUCTION OF GRAIN IN OTHER COUNTRIES, and especially the crops in Europe, have so great effect on the European demand and consequently on our exports and the prices received for them, that the prospects of these crops in Europe have a very decided interest to our farmers, dealers and carriers. Though we sometimes send great quantities



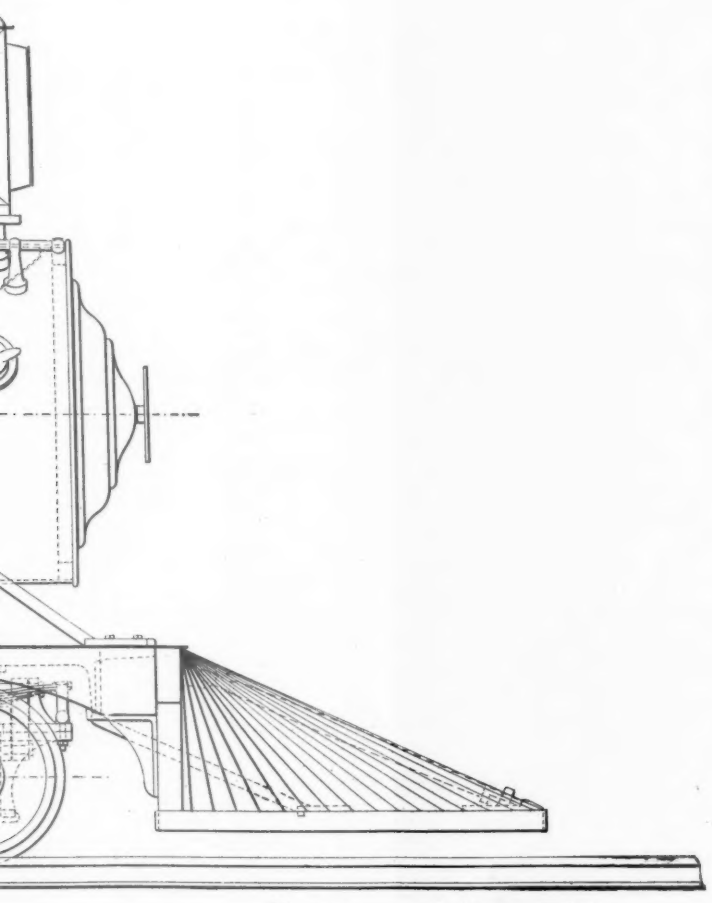
NARROW-GAUGE CONSOLIDATION LOCOMOTIVE

Built by the BALDWIN LOCOMOTIVE WORKS, *Philadelphia.*



MOTIVE, FOR THE CONGLOMERATE MINING COMPANY.

Exhibited at the Exposition o



e Exposition of Railway Appliances, in Chicago.

of wheat to Europe (from the crop of 1880 186 millions of bushels), after all we supply but a small part of the European consumption. The average production of wheat in Europe is about 1,220 millions of bushels, and of rye (which is the chief breadstuff in several European countries) about 1,165 millions. Besides, it draws supplies from countries out of Europe, besides the United States, whose yearly production is about 415 millions of wheat, while our average for the past four years has been 443 millions. This gives an average annual crop of 2,078 millions of bushels from which Europe is supplied to a greater or less extent. Such a decrease as we had in 1881 (118 millions of bushels) after all amounts to less than 6 per cent. of this crop. An increase in the production out of the United States amounting to 10 per cent. amounts to more than 160 millions of bushels, which is more than our total wheat exports are usually. An increase in the rye crop of the same amount makes 115 millions, so that an unusually good crop of these grains throughout Europe would make it entirely independent of this country.

The prospect for grain in Europe is now reported to be generally favorable, except in Austria-Hungary, whose average production is about 90 millions of wheat and 112 millions of rye, and in parts of South Russia, where the locust had appeared. In Great Britain, whose average production is about 70 millions, and France, whose average has been 280 millions, but which last year produced 346 millions, the prospect is good, and these are the chief importers. Spain has an exceptionally good crop, which is harvested, and its average production is 116 millions of bushels. The crop in Egypt, whose average production is about 27 millions, is an average one, and it has been secured. India's crop was harvested last March. It was large, and it produces usually more than 300 millions bushels. The wheat crop was generally good in other countries as well as the United States last year, the result of which is that a considerable surplus is left over as the crop-year closes. A falling off of 80 or 90 millions of bushels in this country, therefore, is likely to have little effect on prices.

THE PACIFIC RAILROADS have shortened the run between Omaha and San Francisco, making the time by the express train 80 hours and 40 minutes, and by the emigrant train 133 hours and 40 minutes. The distance is 1,867 miles, so that the average per hour is 23 miles speed. Heretofore the time of the express has been about 96½ hours, or 19½ miles per hour. There are now numerous routes to compete with the Union Pacific, and there will soon be two more; but all of them are much longer than it. The time made heretofore, which was probably more economical for the railroads than faster time, has been such that a much longer route could do nearly as well without any really fast running. But if the Union and Central Pacific do their best, they will make it impossible for the other lines to keep up with them. By way of the Burlington and the Denver & Rio Grande it is 1,851 miles from Chicago to Ogden, against 1,523 by the Union Pacific; by the Atchison and the Southern Pacific it is 2,347 miles from Kansas City to San Francisco, against 2,081 by the Union Pacific. By the Texas & Pacific the distance is still more than by the Atchison from places as far north as St. Louis—it is 2,645 miles from St. Louis by the Iron Mountain, the Texas & Pacific and the Southern Pacific to San Francisco, against 2,279 by the Wabash, the Union Pacific and the Central Pacific. Thus the old route has so much the advantage of distance that in competition for speed it is always likely to come out ahead. And the distance is so great that a little increase in speed saves a good deal of time. At thirty miles an hour this journey of 1,867 miles from Omaha to San Francisco would requires 62 hours travel; until now it has required 96 hours, and now 80¾ hours. A saving like this on an ocean steamer line between New York and Liverpool would certainly attract a great deal of travel to it. But on long rail routes like this, though the journey is probably more wearisome than the voyage over the Atlantic, the saving of time does not have so much effect, and largely because most people who cross and recross the continent prefer to take different routes going and returning, in order to see as much of the country as possible. The number of persons who make the journey through more than once is not very great, and even the business man likes to see the country on a new route. The new Denver & Rio Grande route to Utah and Ogden is said to have extraordinarily picturesque scenery on it, and many passengers to see this and Denver and Colorado will travel the additional 328 miles without hesitation.

THE NEW YORK, WEST SHORE & BUFFALO RAILROAD was opened to Albany last Monday, and it now competes actively for the important travel between New York and Saratoga, and New York and the Catskills, as well as that between New York and Albany. The Catskill travel is something enormous at this season, and by reason of its direct connections with the local railroads, the West Shore will doubtless afford the quickest route.

It may be said that it is no more direct than the Hudson River Railroad, and that against the latter's ferry at Rondout and Catskill must be set the West Shore's ferry at Jersey City. But, in fact, the former is considered a much greater obstacle by the city people, who will be glad to have only a transfer from car to car in the stations of the Catskill railroads. Further, the West Shore runs through cars in connection with the Ulster & Delaware Railroad, along which is a very large corps of the grand army of "summer boarders" that occupy the Catskill region. The road, too, has a passenger equipment that has probably never been excelled on any railroad; its passenger locomotives burn anthracite to avoid the plague of smoke, and the whole management evidently is designed to offer the greatest possible attactions to travelers, in order to attract them from the older and popular routes. If it had all the Catskill travel to itself it would be a very important source of income; but not only has it to meet the competition of the New York Central, which it may hope to distance, but the more formidable competition of the Hudson River steamboats, which probably take much the larger part of the travel, and do so because traveling by them is very comfortable and very cheap, while the great mass of the people who summer at the Catskills are but moderately well-to-do and need to save a dollar when they can, and are not above saving halves and quarters also. But there is enough railroad travel to make it important to cater for it.

The Albany travel, until through Western connections are established, cannot be very important. Albany is not on the main line of the West Shore, but it runs through trains thither.

The Saratoga travel is probably much more important to the railroads than the Catskill travel. There may be less of it, but it travels mostly by rail and travels a great deal and without much regard to economy. On scarcely any other route in the country are the best accommodations likely to be more appreciated, and the fine equipment of the West Shore road will have its full effect here. The rivalry on this route will be not only between the New York Central and the West Shore roads, but between the Wagner and the Pullman drawing-room and sleeping cars, and the result probably will be an improvement of accommodations.

The West Shore is fortunate in being able to open these routes at this time. The travel is heavy on them, but the season is short, and every week lost counts heavily. When 25 or 30 millions have been put into a new enterprise, it is important to get it at work as early as possible.

LIVE STOCK RECEIPTS AT WEST ALBANY have a special interest this year, because of the competition of live stock and dressed beef for the supply of New England (where the chief sales of dressed beef are made). The receipts of live stock at the West Albany yards in the first half of this year and last were:

	1883.	1882.	Increase.	P. c.
Cattle.....	226,733	163,557	63,176	38.6
Hogs.....	495,400	472,100	23,300	5.0
Sheep.....	1,016,100	547,800	468,300	85.5

The very large increase is somewhat surprising, as there is never anything like so great an increase in consumption of meat in so short a time. A great increase in hogs would not be surprising, as these are packed, and may be consumed chiefly abroad or in other parts of the country. The exports of live stock and fresh meat are usually a very small proportion of the receipts, but of fresh beef, at least, they have been much larger this year than last—amounting to 48,025,234 lbs. in the five months ending with May, against 26,540,912 last year. This increase of 21½ million pounds is equivalent, however, only to about 25,000 or 30,000 head of cattle—perhaps, for the six months, to one-half the increase in receipts at West Albany. This, however, does not help account for the enormous increase in receipts of sheep, equal in meat, perhaps, to 33,000 head of cattle.

Most of the exports of both live stock and dressed beef are made from New York and Boston. In May 74 per cent. of the dressed beef went from New York and 24 per cent. from Boston.

The shipments of dressed beef from the West to New England, mostly over the Grand Trunk and its connections, continue large, we understand, but there are no great sales of it at the large cities or even at small places out of New England. Whether the shipments have been larger or smaller than last year we are not able to say.

THE CHICAGO & ATLANTIC RAILROAD, which has opened business at Chicago with flying colors, taking thence one week more freight than any other road, and the next nearly as much as any, has announced that it will become a party to the Chicago pool. To this end a meeting of the Chicago roads interested has already been called, and if they fail to agree upon the percentage to be awarded to the new road and taken from each old one (as, judging by precedents, they will), this question will be left to the Arbitrator. We understand that the Erie's fast freight line which formerly reached Chicago by the Fort Wayne has been transferred to the Chicago & Atlantic, which will perhaps account for the recent great decrease of Chicago shipments by the Fort Wayne. It does not, however, account for the recent great increase of shipments by the Chicago, St. Louis & Pittsburgh, which, though one of the Pennsylvania's lines, has heretofore carried from Chicago more freight for the Erie than for the Pennsylvania.

NEW PUBLICATIONS.

The Iron Century (Das eiserne Jahrhundert) is the title of a profusely illustrated popular work by A. von Schweiger-Herchenfeld, which the publishing establishment of A. Hartleben, of Vienna and Leipzig, has begun to issue in 25 parts of 32 pages each, at intervals of 10 days. It seems strictly devoted to the exposition and illustration of the more striking applications of modern engineering, especially those connected with transportation, as it promises engravings of the St. Pancras (London) station and the Pennsylvania station in Philadelphia, a large number of bridges, including the Tay Bridge, the great East River Bridge, the St. Louis and the Niagara bridges, the Verrugas viaduct, a wooden viaduct on the "Pacific" Railroad, the Kehl Bridge, viaducts at Franzensfeste, on the Semmering Railroad, and on the Gotthard Railroad; the elevated railroad in New York, several steamships, "an express train in winter on the Pacific Railroad," saloon of an American river steam boat, the projected ship railroad at Panama, a view of Krupp's great iron and steel works, and of the Vivian works in Swansea, the battery deck of an iron-clad when in action, etc. Of 40 full-page illustrations promised, 10 are American structures, and in this first part the American locomotive stares at us several times, and notably as the vignette of the title page, where it rushes toward us with its cow catcher and headlight blazing. Portraits of eminent engineers are shown in the prospectus. In the first eight pages of the chapter on railroads in this first part we have a view of the entrance to the Omaha station of the Union Pacific Railroad as a frontispiece, Cugnot's old street locomotive, a portrait of James Watt and an engraving of Trevithick's "steam coach," with a map of the railroad lines in the city of London. The work is strictly a popular one, and seems well calculated to be very popular. In Germany it costs 15 cents per number, and as no duty is to be paid on books in foreign languages after June, it will probably not cost much more here, and be obtainable from the various German booksellers.

EDITORIAL CORRESPONDENCE.

The Chicago Exposition of Railway Appliances.

The Suspension Car Truck Manufacturing Company, of New York, of which William S. Brewster, of Chicago, is the Western agent, exhibited a variety of car trucks built on its principle; one of them a large six-wheel truck for drawing room and sleeping cars, with 42-in. wheels; one four-wheel truck with 42-in. Paige wheels, 8-ft. wheel-base; one with 33-in. wheels, 7-ft. wheel-base, and several street car trucks. The principle of these trucks consists in suspending the frame by links from the top of the journal-box, thus allowing the wheels to have an action independent of the truck frame; whereas, in the ordinary swing-motion truck, the whole truck frame must move with the wheels. The body of the car is also suspended by links from the centre of the bolster, so that it can swing longitudinally and laterally.

Schutte & Goering exhibited a variety of specimens of their injectors for locomotives and stationary engines, the sizes varying from No. 2, of 172 gallons capacity per hour, with 120 lbs. pressure, up to No. 16, with capacity for 7,552 gallons per hour, with the same pressure; also siphon pumps for lifting water in large quantities; steam valves and check valves for injectors; a boiler washer for washing out locomotive boilers; an exhaust steam induction condenser for stationary engines, steam pumps, etc. These instruments will give a vacuum of from 24 to 26 in. mercury or higher, without the use of any live steam for lifting the water, the exhaust steam inducing the current of water necessary to condense the steam and clear the vacuum. Also blast nozzles to put in chimneys for creating draft where chimneys are too short, or where draft is insufficient; undergrate blowers, to be used for stationary boilers when it is desired to burn cheap fuel, air being delivered underneath the grate and forced through the incandescent fuel; also air compressors, used wherever it is desirable to draw gases through liquids or to aerate liquids, and for a great variety of other uses, where it is desirable to create and maintain a vacuum. As we expect to illustrate these injectors in an early number, a detailed description of them will not be given now.

The Joliet Steel Works exhibited a great variety of articles which they manufacture, including steel rails, steel bars, horse-shoes, spikes, crow-bars, chisels, wedges, etc. etc.; also a specimen of a Morgan rail joint, which consists of a short piece of old rail flattened at the ends, which is placed underneath the joint and held up to the rails above by suitable clamps, the construction of which could not be clearly described without an engraving.

The John A. Roebling's Sons Company, of Trenton, N. J., had on exhibition sections of the cables of the Niagara, the Cincinnati & Covington, and the New York & Brooklyn bridges. The Niagara Bridge cable is 10 in. in diameter and composed of 3,640 iron wires of No. 9 gauge. The ultimate strength of the cable is 6,000,000 lbs. The Cincinnati & Covington Bridge cable is 12 in. in diameter and is composed of 5,180 iron wires of No. 9 gauge; ultimate strength, 8,434,000 lbs. The New York & Brooklyn Bridge cable is 15¾ in. in diameter and is composed of 6,000 No. 7 galvanized steel wires; ultimate strength 22,300,000 lbs.

It also exhibited telegraph and telephone wire, varying in sizes from No. 6 to No. 14, and specimens of wire cable from ⅛ in. to 3½ in. in diameter; flat ropes, which are used in deep mines, and are wound on a drum like a ribbon in order to keep the rope central with the cage shaft; also switch ropes used on switching engines for switching cars.

The T. V. Allis Manufacturing Company, of Trenton, N. J., exhibited the Buckthorn solid steel barb fencing. This fencing is made of a band or ribbon of steel rolled with two central ribs. In the manufacture of this steel, the ribbon is rolled wide enough so that two strips may be cut from it. The barbs for each strip are then punched out of it in the middle, so that there is very little waste in producing the two bands and in making the barbs. These bands are galvanized so as to be protected from corrosion and wound on suitable spools so as to be shipped and used to the best advantage. The same company also exhibited a case of tools for putting up this fencing, with a stretcher for producing the requisite tension, reeler, nippers, staples, file, etc., and complete apparatus for

erecting the fence. It had also a section of the fencing erected on posts on the outside of the building. It showed a creditable oil painting representing a portion of the fence put up in the manner adopted by the Pennsylvania Railroad along its line.

Thomas Prosser & Son, of New York, representing Fried. Krupp, exhibited a variety of specimens of car and locomotive steel tires, ranging in diameter from 30 in. up to 5 ft. These tires are made in different forms. Some are rolled with an internal web for paper wheels.

The National Railway Patent Waste Company exhibited bales of cotton seed hulls intended for use as packing in car journal boxes. It also exhibited a specimen taken from an engine box of the New York, Pennsylvania & Ohio Railroad, which had run over 70,000 miles, another taken from a New York Central freight car, which had run seven months, and another taken from an engine box which had run over 20,000 miles. They were apparently in just as good condition as when put into the box.

The Pennsylvania Steel Company, of Steelton, Pa., exhibited a system of tracks with interlocking apparatus. The interlocking apparatus consists of a lever machine of eight levers and shows the application to three switches and signals. As we expect to illustrate this apparatus fully in a future number, we will not attempt a description here. In connection with the same, several of the switches are provided with hand levers by which also they may be operated. The switches are all of the Pennsylvania Steel Company's pattern, and the frogs in the system are principally spring frogs of its pattern. Beside these it exhibited six specimens of switches that it makes in various forms. It also showed a safety hand lever, which is attached to a split switch and which prevents the lever being thrown open should any obstruction come between the switch and the main rail, and a ground lever for a three-throw switch, which is also applicable to a two-throw switch. It lies flat on the ground when the switch is thrown into position. It also exhibited two interlocking stands with two levers each for switches and signals. With this arrangement the switch lever and the signal lever interlock with each other, so as to make it impossible to give the wrong signal when the switch is thrown over in either position. The signal lever is provided with a compensating apparatus to provide for the expansion and contraction of the wire connection. It also exhibited a variety of switch stands used for different purposes, one an automatic switch stand, which holds the switch in a safe position for trains and acts automatically as a safety switch with a perfect signal of any desired height from the rails. We hope to illustrate this and will not attempt any description here.

This company also exhibited a semaphore switch stand, which operates a semaphore signal in connection with a lamp, and holds the switch with the pin in the dead centre position, where the crank is least liable to be strained; also a variety of stiff frogs of various patterns and several spring frogs of its patent keyed pattern.

Milliken, Boyd & Co., of Youngstown, O., exhibited J. M. Goodwin's patent dump car. The car is intended for handling ore, coal, limestone, coke and other dumpable materials. The car discharges its load on either side or half its load on each side, or part of the load between the rails without any tipping or rocking of the body of the car, by the simple manipulation of valves. The car exhibited was of the four-wheel form. It may be made for either four or eight wheels as desired. The cost of the car is no greater than that of an ordinary gondola of equal capacity.

The Hall Railway Signal Company, of Meriden, Conn., exhibited a full-size signal applied to a model of a double track, showing the application of the ordinary block; also another model, showing the application to a turn-out or to a station, and the model of a crossing with signals applied for the protection of the crossing. The Hall system was originally designed by Mr. Thomas S. Hall, who died in 1881. Since that time the system has been very much improved by his son, Mr. A. W. Hall, and has been in use on the New York & New Haven road for over 17 months, where it has been working very successfully. We will not attempt a description of the system, as we expect at an early day to publish illustrations showing its construction and application.

The Washburn & Moen Manufacturing Company, of Worcester, Mass., and J. L. Ellwood & Co., of DeKalb, Ill., joint manufacturers of the Glidden steel wire, exhibited samples of this well-known barbed wire fencing, which consists of two wires twisted together, with a barb coiled about one of the main wires, both points projecting from between the wires, so that the barb cannot be detached. They exhibited rolls of this wire galvanized and painted. Their exhibit was inclosed in a wire fence of full size. They also showed one of the wire strainers for putting up the fence.

Charles Scott, Keystone Car-Spring Works, Philadelphia, exhibited in a neatly-inclosed space specimens of coiled, elliptic and semi-elliptic car and locomotive springs; also a hydraulic testing machine, on which the action of the springs was shown.

W. H. G. Newth, of Detroit, exhibited his locomotive ash-pan. This is an ash-pan with a dumping bottom. It consists of a series of slats about 8 in. wide, which turn on pivots similar to the slats of an ordinary window blind. It is operated by suitable arms connected to a rod, and that in turn is connected to a lever which is worked by the engineer in the cab. By simply turning the slats end-wise, the contents of the ash-pan are emptied on the track, and by turning the slats flat-wise, it makes a comparatively tight bottom to the pan.

Morris Sellers & Co., of Chicago, exhibited specimens of the Samson rail joint. This consists of fish-plates reinforced in the centre by a projection which is rolled in the plate. A variety of patterns of this joint were exhibited, including some specimens bent cold. The same firm also exhibited specimens of car-journal bearings, locomotive axle journal-bearings and connecting-rod bearings, both babbitted and unbabbitted, and a model of Farrington's machine for adjusting eccentric-rods and valves. Its construction could not be explained without an engraving.

L. S. Boomer, Chicago, lessee of the frog department of the Union Iron & Steel Company, exhibited specimens of steel-rail frogs, switch-stands, split-switches and crossings, also a model of a Clark & Jeffery switch, with the Gray weighted-lever switch stand. The Clark & Jeffery switch resembles an ordinary split-switch, the peculiarity being in the shape of the switch point, which projects above the top of the main rail, thus protecting the main rail from wear.

The Gray Switch Company, of Chicago, exhibited models of its patent continuous rail switch. In this switch, the main rails are sprung over so as to make a connection with the side-track, and engine coming out of the side-track would spring the main rail back into position so as to prevent accident from derailment. The construction of this could not be explained clearly without an engraving. It also exhibited a model of its patented switch-stand applied to the old pattern of stub switch which prevents the derailment of a train in running from either the main track or side track; also a rail frog using the switch bridle for connection.

Gardner & Co., of New York, exhibited a variety of specimens of their car seats, with both fixed and reversible backs. The seats and backs are made of perforated veneers. Their booth consisted of a very neat imitation of a car roof supported on columns, the roof consisting of car veneers, which also are a specialty of their firm. They exhibited specimens of Gardner's patent seat, in which the seat is movable, so that in reversing the back it is thrown forward and inclined backward. The mechanism by which this is done consists of a rack with a pinion on the seat-back arm. The rack is attached to a pendulum arm by which the seat is suspended. This was illustrated in the *Railroad Gazette* some months ago. J. S. Johnson & Co., of Chicago, are Western agents of this firm.

William A. Elmendorf, of Chicago, exhibited specimens of the varnishes of which he is the manufacturer, with panels of Pullman, Illinois Central, Pennsylvania and Fort Wayne Railroad cars finished in their respective colors, and a variety of other specimens of panels, etc., finished with his surfacers and varnishes. He also exhibited specimens of the gums from which the varnishes are manufactured.

The Heath & Mulligan Manufacturing Company, of Chicago, exhibited specimens of mixed and dry colors for railroad purposes in great variety. It had also a variety of panels finished in different colors, showing the effect of their colors and varnishes and the finish which may be produced by them. It makes a specialty of what it calls "I X L," which is made of iron minerals ground in oil, and also of its magnetic iron mineral paint, which is furnished ready for use and packed in suitable cans.

The American Tube Works, of Boston, exhibited a great variety of their brass and copper seamless drawn tubes, which are used for many different purposes. Their exhibit was enclosed with a very neat railing composed of their tubes.

The Chicago Varnish Company exhibited a case containing a great variety of gums used in the manufacture of varnish. These come from Africa and New Zealand. These were extremely interesting and would be worthy of more extended study and description if there had been time. It also exhibited a number of panels showing the outside finish of passenger cars on different railroads, including the Denver & Rio Grande, in Tuscan red; three panels of a Chicago & Northwestern passenger car in orange, a dining-car panel of very dark maroon, almost black, and a sleeping-car panel of lighter maroon; Missouri Pacific, brown olive; Burlington, Cedar Rapids & Northern, a similar color; Chicago, Rock Island & Pacific, a greenish olive; Milwaukee & St. Paul, a dark orange; St. Paul, Minneapolis & Manitoba, Tuscan red; a sleeping-car panel of the Milwaukee & St. Paul, a sort of olive; Terre Haute & Indianapolis, Tuscan red. It exhibited elliptical name panels from different roads which have run from 12 to 24 months, and they were shown as they appeared before being cleaned and after being cleaned with soap and water, indicating the standing properties of this varnish. It also exhibited some tin cans which have the peculiarity that the label is engraved and printed directly upon the tin, the ground work being a sort of terra-cotta color and the lines printed in black. This is done as perfectly as if printed on the best quality of book paper. It exhibited a variety of samples of varnish in cans and bottles.

Manning, Maxwell & Moore, of New York, the Ashcroft Manufacturing Company and the Consolidated Safety Valve Company, had a joint exhibit of a variety of steam gauges, revolution counters, clocks, Tabor steam engine indicators, test pumps, ratchets, fixtures for glass water gauges, low-water detectors, and the Moscrof continuous recorder.

The Consolidated Safety Valve Company exhibited a line of locomotive pop safety valves, with a new incased noiseless Richardson valve, water relief valves and Blackall's steam-chest relief valves. It makes a specialty of its improved locomotive gauge with seamless drawn Bourdon tube and elastic packing ring to prevent moisture and dust from entering the case, blurring the dial and hindering the movement. It exhibits also the Tabor steam-engine indicator. The feature of this is extreme simplicity and lightness of parts, making it practicable to take cards at very high speeds. The parallel motion is given by the peculiar shape of the slot, simplifying the pencil motion, giving only three joints for lost motion. All the weight of moving parts of the paper drum are located at the base to overcome the fling due to any increased weight at high speed. Another feature is the duplex spring averaging instrument, with 3-way cock, nickel-seated range cock for locomotive use.

Manning, Maxwell & Moore exhibited a line of the New York Tap & Die Company's taps and dies, and the Morse Twist Drill Company's twist drills; also track gauges and the I X L gauge.

They also exhibited a tube-welding machine. In addition to welding tubes in the proper form, this machine will weld up bushings, square the heads of staples and do other light work that a small hammer would do.

Foreign Railroad Notes.

In the German Empire, exclusive of Hungary, last year 139,452 railroad employés were examined as to their capacity to distinguish colors. Of these 998, or 0.72 per cent., were found to be color-blind. Of 115,154 examined this year, only 46 were wholly and 273 partly color-blind—0.28 per cent. of the whole number.

The Gotthard Railroad, which cost about $40,000,000, in the first eleven months it was open, ending with April last, earned $1,790,000 gross and $993,000 net. The largest earnings of any month were $202,700, in September. Nearly half of the earnings have been from passengers, but this traffic seems to have fallen off since October.

The rotunda of the building in which the Vienna Electrical Exhibition will be held will be lighted with electrical lamps with an aggregate capacity of 265,000 candles, and the other lights used, some of which will illuminate prominent architectural features of the city visible from the grounds, will bring up the total to 600,000 candle-power—about five times as much as all the street lights of Vienna.

By a census taken June 5, 1883, the number of persons employed in railroad operation in the German Empire was 171,763, of whom 1,318 were women. It appears that men employed in shops were not included in this number. These employés had dependent upon them (families and servants) 533,246 persons, so that the number who may be said to have been dependent upon the railroads for support was 665,482.

In the six months from Oct. 1, 1880, to April 1, 1881, 4,123 tires broke on 65 railroads in Germany, which had 21,247 miles of road—19.4 to every 100 miles of road, against 25 in 1880. There was one tire break to every 124,760 miles run by a wheel. Like rails in this country, the breakages increase in cold weather. In successive months the numbers were:

October.	December.	January.	February.	March.
352	435	1,532	775	592

Below the freezing point 1,553 breakages occurred; above it, 956.

In the different workshops of the Berg & Märk Railroad, now in charge of the state railroad directory at Elberfeld, there are upward of 400 apprentices, whose training is systematically provided for by methods heretofore described. This system has been practiced for many years, and to-day about one-eighth of the employés in these shops and more than half of its skilled mechanics are graduated apprentices. The Rhenish and the Cologne & Minden roads also had provision for the training of apprentices before they became state railroads. On the latter this training was not given, except to a slight extent, in the great repair shops, but for the most part in small, outlying places, it being assumed that at shops in great cities and in manufacturing districts the supply of skilled workmen would be sufficient, and it was thought that the apprentices could be trained better in small shops, where all kinds of work were done, than in a great establishment, where there is great division of labor. But recently it has become evident that a sufficient number of skilled mechanics can no longer be supplied in this way, and therefore in 1880 "instruction shops" were established at Berlin, Bromberg, Dirschau, Königsberg, Frankfort-on-Oder, Breslau, Leinhausen, Cassel, Paderborn, Bingen, Fulda, Limburg and Saarbrücken, and others are to be established elsewhere. When fully occupied these will have 700 to 800 apprentices in course of training. As a rule not more than eight or ten apprentices, 14 to 16 years of age, will be admitted yearly into any one great shop, there to be thoroughly trained under the direction of an especially capable and trustworthy master. The shop instruction is given as has been shown before in these columns, and is united with some school instruction.

Col. James Holland, the Chairman of the Great Indian Peninsular Railway Company, at the annual meeting in London, recently quoted from a Calcutta pamphlet some statements concerning the cost of growing and shipping wheat in India and in this country. This makes the cost of production at the field in India only from $1.32 to $1.56 per quarter, or 16⅛ to 19½ cents per bushel. The average cost of hauling from 13 wheat-producing districts to the nearest railroad station is given as 4½ cents per bushel, the average distance being 30 miles, and roads, vehicles and animals being very poor. From one of the wheat markets near the place of production (Jubbulpore), the freight by rail to Bombay is 20 cents per bushel, the distance being about 600 miles. From the Missouri River points to Chicago, about

500 miles, the rates in this country are usually 20 to 25 cents per 100 lbs., or 12 to 15 cents per bushel; while to the sea the charge is 15 to 18 cents per bushel for about 950 miles.

It would appear that there is some exaggeration of the cheapness of Indian production in this pamphlet, however. It makes out that the prices of wheat at Jubbulpore for six years were from $3.60 to $7.08 per quarter, while the cost of producing and getting it there was, as nearly as we can make out, but $2.04 to $2.30. Yet with a profit of 75 to 200 per cent., there was no great increase of wheat cultivation in India at that time. This is hardly conceivable The pamphlet gives the cost of American wheat in Liverpool as made up of a cost for wheat at Chicago of $1 a bushel at Chicago, a railroad charge of 18 cents to New York, and an ocean charge of 7 cents from New York to Liverpool, and finds the Indian wheat in that port cost less by 5 cents a bushel, while the difference in price is 6 to 9 cents in favor of the American. The ocean freight from Bombay to London is given as about 30 cents a bushel. The pamphleteer ignored the cheap water route from Chicago to New York, by which to-day the cost of carriage per bushel is about 7¼ cents. India, however, does produce wheat very cheaply, and in large quantities. By far the larger part of its production, however, is required for its own immense population, except when the crops of rice and wheat are both good, when it may have a considerable surplus to spare. It harvested a fine crop last March, and will probably make large exports this year. Its average production of wheat is something like 300,000,000 bushels, while its production of rice may be as much as 900,000,000. A crop yielding 5 per cent. more than the average would therefore give no less than 60,000,000 bushels more than the usual amount available for export of one or the other or both of these grains.

The Prussian government proceeds in its policy of forming an exclusively state railroad system, and has just made proposals for the purchase of six of the company railroads left, including the only two important ones—the Berlin & Hamburg and the Upper Silesian, the latter of which it has been working for some time, but does not own. The offers made indicate that Prussia recognizes the right of railroad owners to a good round profit where their roads can earn it. For the Upper Silesian road the government offers pay 10⅓ per cent. yearly on the share capital, with a bonus of 15 marks for every 300 marks share—equivalent to an extra dividend of 5 per cent. The shares are to be converted eventually into government 4 per cent. bonds, which will be issued at the rate of a bond for 3,150 marks for every four 300 marks shares—that is, 262½ to 100. The average dividend on these shares for the last ten years has been 10.59 per cent.; for the last five years, 10.34. The government 4s sell at about 2 per cent. premium. The day before this offer the shares of this road sold for 263.9; the bonds offered for them were worth 272.85. Let the United States offer $200 in its 4s for every $100 share of New York Central, Pennsylvania, Lake Shore, Chicago, Burlington & Quincy, Illinois Central, Chicago & Alton, or even Northwestern preferred, and we will promise such an enthusiasm for a state railroad system (among stockholders) as was never seen in any country. This road will cost Prussia about $33,000,000.

For the Berlin & Hamburg Railroad shares the government offers a perpetual interest of 14½ per cent., exchanging for every two 600 marks shares 4,350 marks in government 4s—362½ for 100, and throws in 60 marks per share cash down in an extra dividend of 10 per cent. What is offered for the shares was worth 380, while the market price of them was 358. All Prussian railroad shares have advanced of late because of the expectation that the goverment would buy them. The average dividend paid by the Berlin & Hamburg for the last ten years has been 12.97 per cent.; for the last five years, 14.85 per cent.

For the Altona & Kiel Railroad a yearly dividend of 9.2 per cent. and an extra dividend of 3 per cent. are offered; for the Breslau, Schweidnitz & Freiburg, a yearly dividend of 4½ per cent., plus a cash payment of 5 per cent. It has paid an average dividend of 5.87 per cent. since 1844; but for the last five years only 4.41 per cent. The shares sold for 110.9, and what is offered for them is worth 119.9. For the Right Bank of Oder road, 5 per cent. cash and 7.4 per cent. yearly; for the Posen & Creuzberg, only 100 marks of government 4s is offered for 300 marks of common stock, and on these bonds interest will not begin for a year after the purchase. For the preferred stock the exchange will be mark for mark. Posen & Creuzberg common is probably something like Wabash or Erie common. It has never received any dividend, and the average dividend on the preferred for the last five years has been but 2.7 per cent.

The stockholders have till Oct. 15 to accept these offers, and are informed that it will be useless to ask for any more. The government can make it go hard with the companies if they refuse what seems a liberal offer. Altogether the shares of these six companies which Prussia proposes to buy amount to about $60,000,000, for which it offers $118,352,000 in government 4s worth 102, the yearly interest on which will be $4,734,000.

The bonds of the companies outstanding, which of course the government will have to provide for, amount to nearly the same as the bonds offered for the stock, namely, to $117,476,000.

Awards of the Juries at the Chicago Exposition.

The following is the supplementary list of the awards made by the juries at the Chicago Exposition of Railway Appliances. These awards are in addition to those given in the list published last week:

SUPPLEMENTARY AWARDS.

Lincrusta-Walton, decorating material, silver medal—J. J. McGrath, Agent.
Ornamental glass, bronze medal—Western Sand Blast Co.
Highway crossing signal, bronze medal—J. S. McLeod.
Power excavator, gold medal—Wilcox & Stock.
Best system of depot drainage, silver medal—Durham House Drainage Co.
Pig-iron breaker, silver medal—Blake Crusher Co.
Locomotive balance, silver medal—Shaw Locomotive Co.
Screw machine, silver medal—Niles Tool Works.
Signal for railroad crossings, silver medal—Union Switch & Signal Co.
Independent brake, silver medal—Rote Automatic Brake Co.
Station clock, silver medal—P. H. Dudley.
Exhaust pipe head, bronze medal—Maypole Bros.
Grate bar for stationary boiler, bronze medal—J. C. Jones.
Rolling floor for railway car or street car, bronze medal—Eureka Rolling Floor Co.
Coal for locomotives, silver medal—Ohio Central Railroad & Coal Co., W. C. Wyman, Agent.
Best tool steel, silver medal—Hussey, Howe & Co.
" Spring steel, silver medal—Hussey, Howe & Co.
" Steam indicator, bronze medal—Ashcroft Manufacturing Co.
Side bearing for cars, silver medal—S. B. Thompson.
Best display of car trucks, silver medal—Suspension Car Truck Co.
Rubber wheels for trucks, bronze medal—Geo. P. Clark.
Best car door bolt, bronze medal—Walter Johnson & Co.
Semi-steel boiler flues, silver medal—National Tube Works.
Grain elevator, silver medal—Wm. Watson.
Torpedo placer, bronze medal—Medcalf & Haber.
Door, window and deck glass, silver medal—G. F. Kimball,

THE SCRAP HEAP.

Locomotive Building.

The Rhode Island Locomotive Works in Providence have just completed two passenger engines, with 18 by 24 in. cylinders and 6-ft. drivers, for the Boston & Lowell road.

The Central Pacific shops in Sacramento have just completed an engine which exceeds in size even the "mastodon" engines lately built for the road. This engine weighs 73 tons, has 10 driving wheels 4 ft. 9 in. in diameter, and a four-wheel truck, and has a tender whose tank will hold 3,600 gallons of water. The total length of the engine and tender is 65 ft. 5 in. The cylinders are 21 in. in diameter and 36 in. stroke, and have the valve gear devised by General Master Mechanic Stevens. The engine will be used to haul freight trains over the Sierra Nevada grades.

The Manchester Locomotive Works in Manchester, N. H., have just delivered two passenger engines, with 17 by 24 in. cylinders and 5½ ft. drivers, to the Boston & Lowell road.

The Nashville, Chattanooga & St. Louis shops in Nashville, Tenn., have rebuilt seven old locomotives within a few months. The new boilers made for these engines are all of Tennessee iron.

Car Notes.

The Ensign Manufacturing Co. at Huntington, W. Va., has just completed 130 cars for a Mexican road, and is now building 400 box cars, of 20 tons capacity, for the New York, Pennsylvania & Ohio road. A contract has just been closed to build 500 box cars for the Chesapeake & Ohio.

The Indianapolis Car Works in Indianapolis, Ind., are at work on a contract for 300 box cars for the Chicago, St. Louis & Pittsburgh road. These cars are to be 34 ft. long and to carry 20 tons each; they are to be run in the Hoosac Tunnel Line.

At the shops of the Chicago, Burlington & Quincy road, at Aurora, Ill., 10 second-class coaches are in course of construction. They are 49 ft. 2 in. in length, and 9 ft. 8 in. wide. The inside finish is in oak, ash and cherry. The clear-story ceiling is made of pine strips 1½ in. wide, tongued and grooved, and laid lengthwise. The aisle between the seats is laid with alternate walnut and maple strips. A peculiar method for stiffening the car body without using brace-rods, is a noticeable feature in the construction. The sills are slightly arched between the bolsters, and their ends also are inclined upward. A strip of sheet iron about ⅛ in. thick and 28 in. wide, with a piece of angle iron riveted to its lower edge, is then fastened by wood screws to the studding and window-posts on the inside, while the angle iron is fastened in like manner to the sill, the iron in connection with the sill forming a truss-plate, which is said to be stronger and more unyielding than brace-rods. The inner surface of the sheet iron is grained. Baggage cars are trussed in a similar way by fastening the sheet iron to the inside of the sill, the strip being wide enough to reach about 10 in. below it. To each side of the iron underneath a plank is then bolted, the bolts running through the wood and iron, and the whole forming an effective truss. Two 40-ft. mail cars trussed in this way are also being built. In addition to the above, the Aurora shops are engaged upon 10 new refrigerator cars and 40 new 34-ft. flat cars.—*National Car-Builder.*

The Paige Car-Wheel Co. in Cleveland, O., has just shipped steel-tired wheels of the Paige pattern to the Jones Car Works at Schenectady, N. Y., to be used under 15 new passenger cars for the New York Central road.

Bridge Notes.

The Passaic Rolling Mill Co., at Paterson, N. J., has taken the contract for a bridge over Sands street, in Brooklyn, in connection with the New York and Brooklyn Bridge approach. The company is building a new iron bridge over the Passaic River, near Little Falls, N. J., for the Delaware, Lackawanna & Western road, to replace a combination truss bridge now in use.

The Wrought Iron Bridge Co. at Canton, O., is building an iron highway bridge over the Colorado River, at La Grange, Texas.

Iron Notes.

The Springfield Iron Co. in Springfield, Ill., is running full in all departments. A new plate train is nearly finished, which will roll steel boiler plate up to 9 ft. wide.

The rod mill of the Cleveland Rolling Mill Co. in Cleveland, O., is very busy, and is making 60,000 lbs. a day of steel wire rods.

The Roane Iron Co. in Chattanooga, Tenn., has eight furnaces in operation. At present the mills are filling a large order for muck bar to go to Cincinnati.

The works of the Bethlehem Iron Co. in Bethlehem, Pa., have shut down entirely for the present.

The Helmbacher, Forge & Rolling Mill Co. in St. Louis is putting in a new steam hammer and a 75-ton testing machine

The South Tredegar Iron Co. in Chattanooga, Tenn., has taken a large contract for spikes and splice-bars for the new Louisville, New Orleans & Texas road.

The St. Louis Ore Steel Co. are putting in their mills in St. Louis the Gustin patent hot-bed and straightening apparatus for rails.

The Standard Nut Co. has moved its new works in Pittsburgh.

The Solid Steel Co., a new corporation, has completed its works at Alliance, O., and announces that it is now ready to manufacture steel castings for any purpose.

Manufacturing Notes.

The United States Mineral Wool Co., of New York, received in May and June orders for 261,000 lbs. of mineral wool to be used in packing the floors, etc., of passenger cars.

The Shultz Belting Co. in St. Louis recently received a large order for leather belting to go to Verviers, Belgium.

The Ajax Metal Co., of Philadelphia, which has bought the right to make "Ajax" metal from the Elkins Manufacturing & Gas Co., furnishes ingots or castings of Ajax white metal, which is used for journal bearings, which it is supplying monthly to the New York Central & Hudson River; Philadelphia & Reading; Columbus, Hocking Valley & Toledo; Delaware, Lackawanna & Western; Pittsburgh, Cincinnati & St. Louis, and the Lake Shore & Michigan Southern roads.

The Rail Market.

Steel Rails.—Not much new business is reported, but quotations are lower, and $37 to $39 per ton at mill are now given. It is reported that an order for 10,000 tons has been placed at $36.50, and several orders have been taken at $37 for fall delivery.

Rail Fastenings.—No change is reported from last week's quotations. Spikes, $2.60 per 100 lbs.; track-bolts, $3 to $3.30 per 100 lbs.; splice-bars, 2 cents per pound.

Old Rails.—The market has been dull, and quotations are entirely nominal.

The Chicago Exposition—A Correction.

In the mention made last week of the Otis Iron & Steel Co.'s exhibit at Chicago the dimensions of their large steel plate should have been ⅝ in. thick by 56 in. wide by 626 in. long. A typographical error in the account given made it 26 in. wide instead of 56 in., as it should have been.

The Gifford Car-Coupler on the Erie.

The dispatch noted last week, to the effect that the entire freight equipment of the New York, Lake Erie & Western road was to be fitted with the Gifford car-coupler, was too sweeping in its statements. The Erie has acquired the right to experiment with the Gifford coupler, and will give it an extensive test in actual practice. For that purpose it will be put on a number of freight cars and will be thoroughly tried in daily use, but it has not been adopted for the entire freight equipment, and will not be adopted unless the test proves it to be a successful and practical invention.

Caring for Injured Employes.

The medical department of the Cincinnati, New Orleans & Texas Pacific road has caused medicine chests to be placed at all the principal stations on the entire system Upon the front of each chest are printed the following directions:

"First—This chest is to be used solely for the injured of the Cincinnati, New Orleans & Texas Pacific Railway.

"Second—Arrest bleeding from a wound by pressure with a sponge moistened with cold or very hot water; if the loss of blood is considerable, apply the tourniquet. The pad of the latter must be applied to the inner side of the arm, below the shoulder, in injuries of the arm; to the front surface of the thigh, below the groin, in those of the leg.

"Third—In small, clean cut wounds, bring the edges together with strips of adhesive plaster; in wounds more than an inch in length, unite the edges with stitches.

"Fourth—If a wound is ragged and torn, clean it as thoroughly as possible; then cover it with vaseline and a thick layer of cotton. Fix this dressing by applying a bandage as even as possible, and with moderate firmness.

"Fifth—When a limb is evidently broken, place it in as natural a position as possible, until the local surgeon of the company can see the patient.

"Sixth—The —— will be responsible for the proper care of this chest, which must not be removed from the station at ——, except in cases of accident to passengers on, or employés of, the Cincinnati, New Orleans & Texas Pacific Railway.

"Seventh—In case of a serious accident in which a number of persons are injured, procure the services of a sufficient number of competent surgeons, and notify the chief surgeon at once of the number of the wounded and the extent of their injuries, and whether sufficient surgical aid can be obtained in the vicinity."

Attempts at Train-Wrecking.

A dispatch from Petersburg, Va., July 9, says: "Two daring attempts were made Saturday night to wreck the south and north-bound fast-mail trains on the Wilmington & Weldon Railroad, near Wilson. In both instances within about a mile of each other rails were piled across the track. They were knocked off by the engines without accident to the trains."

Train Accident Report—A Correction.

Mr. George C. Wilkins, General Agent of the Northern Central, the Philadelphia, Wilmington & Baltimore and the Baltimore & Potomac roads, sends us the following:

"In your issue of the 6th inst., I observe under the head of 'Train Accidents in May—Collisions—Butting'—as follows:

"'On the night of the 15th, there was a butting collision between two freight trains of the Baltimore & Potomac road near Seabrook, by which both engines were badly broken and an engineer hurt.' This report is not correct.

"The accident occurred on a portion of the double track of the Potomac road. The facts are as follows:

"A car on a north-bound freight train from some unexplained cause jumped the track, throwing five other cars over toward the south-bound track, just as a south-bound freight train was approaching, which ran into the side of the derailed cars, slightly damaging the engine and cars; the engineer also received slight injuries."

Running Expenses of Tramway Locomotives.

The last number of *The London Engineer* contains a table showing the running expenses of six tramway locomotives built by Messrs. Merryweather & Co., of London, and in use on the Stockton & Darlington steam tramways. These expenses include wages, repairs and renewals, fuel, oil, waste and water. The average cost of these per engine mile is 3.12d. = 6.24 cents.

The Highest Bridge in the World.

This is the railway viaduct of Garabit, in France, now being erected over a river in the department of Cantal. The total length is about 1880 ft., and near the middle of the great centre arch, the height from the bed of the river to the rail is 413 ft. The viaduct was begun in 1881, and is to be completed next year.—*Engineer.*

The Kinzua viaduct on the Erie railway is 301 ft. high.

Flangeless Wheels.

On the Hamburg tramways a number of cars with flangeless wheels, much like omnibuses, and with turning gear,

are working. To run on the lines, these cars are fitted with a shaft in front of the front wheels, this shaft carrying on a lever a disc wheel which the driver can lower into the tramrail groove as he requires, or raise it when it is necessary to get out of the way of obstructions. The arrangement works well, saves a lot of trouble, and the cars run easier than those with flanged wheels.—*Engineer.*

Enemen Obtaining Concessions in England.

The Engineer says: "The agitation which has been carried on by the engine-drivers and firemen of the London, Brighton & South Coast Railway Company for an improvement of the conditions as to hours of work and wages under which they are employed has just come to a peaceful termination. The unanimity of the men may be understood from the fact that the memorial to Mr. Stroudley, the Locomotive Superintendent of the line, asking for a regular scale of wages for drivers with a maximum of 7s. 6d. per day, and for firemen with a maximum of 4s. 6d. per day, and a scale of overtime for Sunday duty, had appended to it 616 signatures out of a possible total of 660 drivers and firemen employed by the company. Mr. Stroudley, who recently received at Brighton a deputation consisting of twenty drivers and firemen from all parts of the line, has granted the main portion of the concessions asked for by the memorialists. Drivers and firemen will, for the future, start at 6d. a day increase on the former scale, the goods and local train-drivers reaching a maximum of 7s., and the express men 7s. 6d. a day. In addition, no man is to sign for duty on Sunday under the day's pay."

Native Engine Drivers on Indian Railways.

The Madras Railway Co. has been endeavoring to carry out the wishes of the government with regard to the employment of natives as engine drivers, but so far with only medium success. Since the month of June, 1881, 19 men, selected out of some three times the number of applicants, have been engaged; but out of this number nine either gave up the employment in a very short time or were dismissed as unsuitable.—*The Engineer.*

The Preservation of Sleepers.

According to experiments made upon the Hanover, Cologne & Minden Railway, fir sleepers injected with chloride of zinc required a renewal of 21 per cent. in 11 years; birch sleepers injected with creosote required a renewal of 46 per cent. at the end of 22 years; oak sleepers injected with cloride of zinc required a renewal of about 21 per cent. at the end of 17 years; while the same kind of sleepers in their natural state required a renewal of at least 49 per cent. at the end of a like period. The conditions in each of these cases were very favorable for obtaining trustworthy proofs. The subsoil of the line was good; the non-renewed sleepers showed, when cut, that they were in a sufficiently good state of preservation. Upon another line, where the oak sleepers were not injected, it was necessary to renew them in the proportion of 74 per cent. at the end of 12 years; these same sleepers injected with chloride of zinc required a renewal of only 3.29 per cent. at the end of 7 years; while those injected with creosote required a renewal of only 0.09 per cent. at the end of 6 years.—*The Engineer.*

Destroying an Old Landmark.

Forty years ago the landmark yesterday destroyed was known as "Cradle Rock," and a child of ten summers could go upon either end of it and rock it like a cradle. It was an immense bowlder, 20 ft. long, 16 ft. wide and 12 ft. deep, pivoted upon a rock beneath and jutting over the precipice 400 feet above the creek that runs through the Narrows. Children had clambered around it, men of gray beards had climbed the steep mountain side to sit upon the rock and take in the scenery below, and many lovers had neglected their Sabbath devotion to hold feast of love upon the "Cradle Rock." They will do so no more.

At eight o'clock yesterday morning Superintendent Haggerty, of the Pennsylvania Railroad, had four men on top of the precipice placing heavy jacks beneath the immense bowlder, while four more were beneath taking the steel rails up from the track for a distance of one hundred feet, over which the rock was expected to roll. At 8:30 the rails were up, and the immense jack was placed under the inner side of the rock. They were all ready for the coming of Vice-President Millholland and a number of invited parties to witness the fall of the immense stone. But its base rest was more fragile than the superintendent thought, and the slight pressure from the jack preparatory to the more powerful turns upset the equilibrium of the rock and it came pitching down the crag with less than a dozen witnesses. It first struck a projecting rock of 25 tons and sent it hurling down the precipice and breaking into a million pieces, which fell like great bailstones into the water below. The immense bowlder then fell perpendicularly down the precipice for 100 ft., where it struck the pack rock which frosts and thaws of unnumbered ages had piled up until it was 150 ft. deep. Here the great mass broke into four pieces, which came down the declivity with a rush, grinding the small rock to powder, and cutting away trees as a scythe cuts through barley. The great jar as it struck the base of the precipice not only broke it into four pieces, but every particle was jarred, and as it swept down the side of the mountain it threw off largo pieces of stone as if by centrifugal force. Reaching the embankment alongside the railroad, every piece but one reached the road and landed in the creek, but the larger piece landed upon the outside of the embankment, carrying away three or four ties. No injury was done to the road.

The rock come down with a sound like rattling musketry, and as it landed at the base of the mountain quaked on both sides of the Narrows, while sulphurous smoke and a dense dust filled up the Narrows like a cloud, and, as our reporter passed the cotton factory below the entrance to the Narrows, he found that there was not a pane of glass left in 94 windows of that large, four-story building. The old rock is gone. The march of industry, the demands of business encroached upon the landmarks of old, and the aged, with a sigh-look back to sweet memories of the past, while its sorrows are forgotten—as the griefs of to-day will be buried in everlasting oblivion that precedes the coming brightness of eternal dawn.—*Cumberland (Md.) Times.*

Arrest of Train Wreckers.

The police of Schenectady, N. Y., have arrested Alfred Youngs and two brothers named Myron and Youngs Dowling, upon charges of removing a rail on the New York Central & Hudson River road, near Schenectady, on the night of June 29, 1878, whereby an oil train was wrecked and a brakeman named Platt S. Truax burned to death. The charges are made on the testimony of an associate of the men, who was not concerned in the crime, and it is believed that sufficient evidence to convict them has been secured.

The Engineer as a Musical Critic.

"I was loafing around the streets last night," said Jim Nelson, one of the oldest locomotive engineers running into New Orleans, "and as I had nothing to do I stepped into a concert and, heard a slick-looking Frenchman play a piano in a way that made me feel all over in spots. As soon as he sat down on the stool I knew by the way he handled himself that he understood the machine he was running. He tapped the keys away up one end just as if they were gauges and he wanted to see if he had water enough. Then he looked up as if he wanted to know how much steam he was carrying, and the next moment he pulled open the throttle and sailed out on the main line as if he was a half hour late.

"You could hear her thunder over culverts and bridges, and getting faster and faster, until the fellow rocked about in his seat like a cradle. Somehow, I thought it was old '36' pulling a passenger train and getting out of the way of a special. The fellow worked his keys on the middle division like lightning; and then he flew along the north end of the line until the drivers went around like a buzz-saw, and I got excited. About the time I was fixing to tell him to cut her off a little he kicked the dampers under the machine wide open, pulled the throttle away back in the tender, and, Jerusalem jumpers! how he did run! I couldn't stand it any longer, and yelled to him that she was pounding on the left side, and if he wasn't careful he'd drop his ashpan.

"But he didn't hear me. No one heard me. Everything was flying and whizzing. Telegraph poles on the side of the track looked like a row of cornstalks, the trees appeared to be a mud bank, and all the time the exhaust of the old machine sounded like the hum of a bumblebee. I tried to yell out, but my tongue wouldn't move. He went around the curves like a bullet, slipped an eccentric, blew out his soft plug, went down grades fifty feet to the mile, and not a confounded brake set. She went by the meeting point at a mile and a half a minute and calling for more steam. My hair stood up like a cat's tail, because I knew the game was up.

"Sure enough, dead ahead of us was the headlight of the special. In a daze I heard the crash as they struck, and I saw cars shivered into atoms, people mashed and mangled, and bleeding, and gasping for water. I heard another crash as the French professor struck the deep keys away down on the lower end of the southern division, and then I came to my senses. There he was at a dead standstill, with the door of the fire-box of the machine open, wiping the perspiration off his face, and bowing at the people before him. If I live to be a thousand years old I'll never forget the ride that Frenchman gave me on a piano."—*New Orleans Times-Democrat.*

The Massachusetts Commission on the Ironstone Accident.

In regard to the recent collision at Ironstone, on the New York & New England Railroad, the Massachusetts Railroad Commissioners report as follows: "A freight train of 11 cars going west collided July 7 with an east-bound passenger train (No. 54) of four cars, doing, fortunately, little damage to property and none to person. The conductor of the freight train freely admits that he made a mistake in reading the time-card. No. 54 was due at Blackstone at 8:31 and at Jackson's at 8:10. He thought it was due at Jackson's at 8:31, and that he should have time to reach Jackson's and go upon the side-track before it arrived. This mistake caused the collision The engineer took the conductor's word for the time, and he admits that he was wrong in so doing. The engineer also states that he saw the passenger train, which had come to a stop at a distance of 500 yards. He reversed his engine but did not dare to use steam, for fear that the engine would go back without any control. He also applied the power brake. He said that he used sand and called for brakes, but the evidence shows that he did neither, but that he promptly leaped from the engine without taking due care of his train. If he had done his utmost, moving as he was on an up-grade of 45 ft. to the mile, a collision probably would have been avoided."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Atlanta & West Point, annual meeting, in Atlanta, Ga., July 25.

Vicksburg & Meridian, adjourned annual meeting at the office in New York, July 16, at noon.

Dividends.

Dividends have been declared as follows:

Atchison, Topeka & Santa Fe, 1½ per cent., quarterly, payable Aug. 15, to stockholders of record July 14.

Atlanta & West Point, 3 per cent., semi-annual, payable July 10.

Housatonic, 2 per cent., quarterly, on the preferred stock, payable July 16. Transfer books close July 5.

Long Island, 1 per cent., quarterly, payable Aug. 1. Transfer books close July 20.

Mobile & Ohio, 3 per cent., on the first-preferred income and sinking fund debentures, payable 1½ per cent., Aug. 1 and 1½ per cent. Feb. 1, 1884.

Oregon Railway & Navigation Co., 2½ per cent., quarterly, payable Aug. 1. Transfer books close July 16.

St. Louis & San Francisco, 3½ per cent., semi-annual, on the first-preferred stock, payable Aug. 1. Transfer books close July 16.

Railroad and Technical Conventions.

The *New England General Freight Agents' Association* will hold its regular semi-annual meeting at the Wentworth House in Newcastle, N. H., July 18.

The *General Baggage Agents' Association* will hold its next semi-annual meeting at the Tremont House, Chicago, Aug. 8.

The *International Association of Traveling Passenger Agents* will hold its annual convention in Detroit, Mich., Aug 15.

The *Road-Masters' Association of America* will hold its first regular meeting in St. Paul, Minn., Sept. 12.

The *Master Car-Painters' Association* will hold its annual convention in Baltimore, Sept. 19.

The *New England Road-Masters' Association* will hold its first annual meeting in Boston, Sept. 20.

The *American Street Railway Association* will hold its next meetiug in Chicago, Oct. 9.

The *General Time Convention* will hold its fall meeting at the Grand Pacific Hotel in Chicago, Oct. 11.

The *Southern Time Convention* will hold its fall meeting at No. 46 Bond street, New York, Oct. 17.

The *American Association of Railroad Superintendents* will hold its fall meeting in Washington, Oct. 23.

Foreclosure Sales.

The *Meadville Railroad* is advertised to be sold under foreclosure of mortgage by Samuel B. Dick, Trustee, at Meadville, Pa., Aug 20. The road extends from Meadville west to Linesville on the Erie & Pittsburgh road, 22 miles, and is operated by the Pennsylvania Company. The total bonded debt is $125,000, and holders of $117,000 bonds joined in the request to the Trustee to sell the road. The terms of sale will be one-quarter cash down, the balance within 30 days.

Brotherhood of Locomotive Engineers.

A meeting or reunion of the Brotherhood of Locomotive Engineers was held in St. Paul, Minn., July 1. The meeting began in the morning, when an hour or more was occupied in social converse and instructions in the secret work of the order. There were 110 members present, representing eighteen divisions, mostly from roads centering at St. Paul, although there were several present from Vermont, Massachusetts and other Eastern states. At the conclusion of the business in the morning the members proceeded to the Metropolitan Hotel, where an elegant banquet was served between 12 and 1 o'clock. The members, with their wives and invited guests, numbered 206 who occupied seats at the banqueting tables. The open meeting of the Brotherhood took place at the Opera-House at 2 p. m., when Grand Chief Engineer Arthur made a long and interesting address on the history, work and purposes of the Brotherhood. Speeches were made by Messrs. W. L. Kelly and J. J. Egan, of St. Paul, the exercises being enlivened at intervals by music. The reunion was much enjoyed by those present.

Old Colony Railroad Beneficial Association.

At the annual meeting of this Association last week, the reports showed that during the past year $900 were paid out for deaths of members and $815 for sick benefits. The trustees report $3,000 in their hands. The Association is composed of employés of the Old Colony Railroad.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—Mr. H. C. Barlow has been appointed General Freight Agent. He has been Assistant General Freight Agent for several years and Acting General Freight Agent since Mr. J. F. Goddard was made Traffic Manager.

Canadian Pacific.—On and after July 1, 1883, junction mileage and all reports or correspondence in connection with the car service of both the Eastern and Western divisions of this railway should be addressed to Mr. R. H. Smith, Car Accountant, Montreal.

Tracers for cars delivered to the Western Division may be addressed, as heretofore, to Mr. G. H. Stanton, Car Service Agent, Winnipeg, Manitoba.

Cape Cod Ship Canal Co.—The new company organized under this name has elected the following officers: President, Wm. H. Seward, Jr., New York; Vice-President, Joseph P. Hoile, Boston; Treasurer, Samuel Fessenden, Sandwich, Mass.; Clerk, Wm. Howland.

Chicago, St. Louis & Pittsburgh.—Mr. H. R. Dering is appointed Assistant General Passenger Agent, with office in Indianapolis, Ind.; to date from August. 1, next.

Dubuque & Northwestern.—At a meeting held in Dubuque, Ia., July 7, the following directors were chosen: G. B. Burch, J. P. Farley, A. A. Cooper, W. H. Day, William Ryan, John Thompson, M. M. Walker, John Bell and B. B. Richards. The board then elected the following officers: President, George B. Burch; Vice-President, J. P. Farley; Treasurer, John Bell; Secretary, H. S. Hetherington.

Fort Wayne, Goshen, Elkhart & South Bend.—The officers of this new company are as follows: President, Edwin Evans; Vice-President, Henry M. Williams; Directors, M. Hamilton, Charles McCulloch, George W. Pixley, Wm. Rogers, A. C. Trentman; Secretary and Treasurer, Charles E. Bond. Office in Fort Wayne, Ind.

Georgia Pacific.—Mr. John W. Johnson, late Vice-President, has been chosen President in place of John B. Gordon, resigned.

Illinois Railroad & Warehouse Commission.—Under the act of the late Legislature creating a Weighmaster's Department, the Illinois Railroad & Warehouse Commissioners have appointed George T. Torrence State Weighmaster, with office in Chicago, and John Wade First Assistant Weighmaster.

Jeffersonville, Madison & Indianapolis.—The following circular from the Pennsylvania Company, lessee of this road, is dated Pittsburgh, July 1:

"The following appointments, to take effect from date, are hereby made for the Jeffersonville, Madison & Indianapolis Railroad: E. A. Ford, General Passenger and Ticket Agent, official address, Pittsburgh, Pa.; Chas. O. Scull, Chief Assistant General Passenger Agent, official address, Pittsburgh, Pa.; H. R. Dering, Assistant General Passenger Agent, official address, Louisville, Ky."

Litchfield, Carrolton & Western.—The officers of this company are: President, G. W. Davis; Vice-President and General Manager, H. S. Carroll; Chief Engineer, C. J. DuBois. Office in Carrolton, Illinois.

Lockport & Buffalo.—This company has elected Thomas T. Flagler President; Lewis S. Payne, Vice-President; Joseph A. Ward, Secretary and Treasurer. The road is leased to the New York, Lake Erie & Western.

Maryland Central.—Mr. O. R. Ford has been appointed General Superintendent, with office in Baltimore. Mr. S. G. Boyd, late Superintendent, remains with the company as General Freight and Passenger Agent.

Mobile & Girard.—At the annual meeting in Columbus, Ga., July 4, the old directors were re-elected, as follows: C. S. Lee, J. D. Murphree, Troy, Ala.; N. P. Banks, Guerryton, Ala.; N. N. Curtis, F. H. Mitchell, John Peabody, Columbus, Ga.; W. G. Raoul, Savannah, Ga. The board re-elected W. G. Raoul President; W. L. Clark, Superintendent; J. M. Frazer, Secretary and Treasurer.

Niagara Bridge Co.—Mr. C. C. Schneider has been appointed Chief Engineer of this company, which is building the new bridge over the Niagara River for the use of the Canada Southern road.

Old Colony Railroad Beneficial Association.—At the annual meeting last week the following officers were elected: President, Edward A. Fisher; Secretary, F. Whitten; Treasurer, C. F. Russell; Financial Secretary, R. E. Darrah; Directors, J. C. Sanborn, F. H. Forbes, D. F. Desmond, E. A. Fisher, R. E. Darrah, G. W. Wilson, G. W. Holbrook, F. Whitten, A. O. Brown, Gardner Adams, C. F. Russell, P. W. Jackson, W. A. Card; Trustees, G. W. Wilde, S. C. Putnam, J. C. Sanborn.

Pennsylvania Company.—Mr. H. R. Dering is appointed Assistant General Passenger Agent, with office in Indianapolis, Ind., to date from Aug. 1. He will also assume the duties heretofore performed by Mr. Robert Emmett, District Passenger Agent, resigned.

Pittsburgh, Chartiers & Youghiogheny.—Mr. George S. Griscom has been chosen Vice-President and General Manager. He held the same position formerly, but for some time past has been General Superintendent of the Cincinnati, Hamilton & Dayton.

Richmond & Allegheny.—The following circular was issued before the appointment of the Receivers: "Mr. J. P. Williams having resigned as Paymaster, Property Agent and Fuel & Tie Agent, the duties will hereafter devolve upon the following persons: Mr. R. B. Snead, Treasurer, will have charge of the Pay Department; Mr. R. Shirreffs, Engineer, will assume charge of the company's real estate; Mr. M. Sweeney, Purchasing Agent, will take control of the Fuel and Tie Department."

The Receivers, Lawrence Myers and Decatur Axtell, issued the following circular, dated Richmond, Va., June 28: "In taking charge of the property and affairs of this company, the Receivers announce their desire and intention to retain all persons in their present positions unless the proper management of the interests in their charge should hereafter appear to them to require changes. It is expected that each individual will continue, without other notice, to discharge the duties that have heretofore been assigned to him."

Spuyten Duyvil & Port Morris.—At the annual meeting in New York, July 10, the following directors were chosen: Samuel F. Barger, John E. Burrill, Chauncy M. Depew, John B. Dutcher, Joseph Harker, Wm. H. Leonard, Robert J. Niven, James H. Rutter, Augustus Schell, Wm. H. Vanderbilt, Wm. K. Vanderbilt, Cornelius Vanderbilt, Frederick W. Vanderbilt. The road is leased to the New York Central & Hudson River.

Stonington & Providence Steamboat Co.—Mr. F. W. Popple has been appointed General Passenger and Ticket Agent, with office at No. 177 West street, New York. He has been Acting General Passenger Agent for some time.

Terre Haute & Indianapolis (Vandalia Line).—Mr. H. R. Dering is appointad Assistant General Passenger Agent, with office in Indianapolis, Ind.; to date from August 1. He will also assume the duties heretofore performed by Mr. Robert Emmett, District Passenger Agent, who has resigned.

Toledo, Cincinnati & St. Louis.—At a meeting of the board in Boston, July 10, Messrs. C. S. Brice, H. D. Terrell and Samuel Thomas were chosen directors in place of S. C. Blanchard, W. A. Haskell and R. M. Pomeroy, resigned. The new directors represent the Seney syndicate, which has acquired an interest in the road.

Virginia Midland.—Mr. J. S. B. Thompson has been appointed Assistant General Freight and Passenger Agent in place of F. T. Hawks, deceased.

Wheeling & Harrisburg.—The officers of this new company are: President, G. Baird; Secretary and Treasurer, J. Wood. Office in Wheeling, W. Va.

Worcester & Shrewsbury.—At a meeting held in Worcester, Mass., July 3, Messrs. H. H. Bigelow, J. F. Bigelow, J. H. Clarke, E. B. Stoddard and C. S. Turner were chosen directors in place of G. B. Buckingham, Edward Buxton, J. M. Drennan, G. E. Hapgood and C. H. Perry, resigned. The Board then elected J. F. Bigelow Superintendent in place of J. J. Coburn, resigned.

PERSONAL.

—Mr. Edgar H. Andruss has resigned his position as General Purchasing Agent of the Lake Erie & Western Railroad.

—Mr. F. H. Medary, Treasurer of the Columbus, Hocking Valley & Toledo Co., died July 2, in Cleveland, O., of consumption.

—It is reported that Mr. Bradford Dunham has tendered his resignation of his position as General Manager of the Trans-Ohio divisions of the Baltimore & Ohio Railroad.

—Gen. John B. Gordon has resigned his position as President of the Georgia Pacific Railroad Co., in order to devote his whole time to the management of his interests in Florida.

—Mr. Carl A. Goodnow has resigned his position as Superintendent of the New Haven & Northampton Road, after two years' service. It is understood that he will go to a Western road.

—Mr. John B. Wrenn has resigned the position of Southern Passenger Agent of the Louisville, New Albany & Chicago road to accept a position with the Pennsylvania Railroad at Philadelphia.

—Col. Robert Emmett has resigned his position as District Passenger Agent at Indianapolis for the Pennsylvania Company and the Vandalia Line, to date from Aug. 1. He has been connected with the Vandalia Line for 12 years past.

—Mr. J. S. Lincoln, who lately resigned as General Freight Agent of the Boston & Lowell Railroad, has been presented by his late associates of the New England General Freight Agents' Association with an elegant marble clock and bronze ornaments.

—Mr. Robert Hare Powel, a well-known coal operator and iron manufacturer, died suddenly at his residence in Saxton, Pa., July 9, aged 57 years. He was one of the first men to appreciate and develop the bituminous coal resources of Central Pennsylvania. He owned the Cornwall Railroad, which served some of his furnaces.

—Mr. Washington A. Roebling has resigned his position as Chief Engineer of the New York & Brooklyn Bridge. It is to be hoped that entire rest and relief from care and responsibility will enable Mr. Roebling to recover in some measure his health, which has been so seriously impaired by his labors in connection with the great bridge.

—Mr. Charles R. Marvin, the senior member of the New York Stock Exchange, died at his residence in Brooklyn, July 7, aged 72 years. He became a stock broker at an early age, and was made a member of the Exchange in 1834. Mr. Marvin was at one time Treasurer of the Chicago & Northwestern Co., and for several years a director of the Chicago, Rock Island & Pacific.

—Mr. E. H. Waldron, who has resigned his position as General Manager of the Lake Erie & Western road, intends to retire from railroading altogether for a time, and to occupy himself with the management of a large stock farm which he owns. Mr. Waldron's resignation has not yet been accepted, and he has been asked to withdraw it, but it is said that he has positively refused to do so.

—Mr. Lloyd Chamberlain, Treasurer and Purchasing Agent of the Lehigh Valley Railroad, died at his residence, in Camden, N. J., July 7, aged 76 years. Mr. Chamberlain had been suffering from an affection of the heart and lungs for about two months, which finally caused his death. He was a civil engineer by profession, and had been connected with the Lehigh Valley Railroad and the Beaver Meadow line, which merged into the former road in 1864, for the past 41 years. He was a native of Philadelphia, but had lived in Camden for about 30 years.

—Mr. George S. Griscom has resigned his position as General Superintendent of the Cincinnati, Hamilton & Dayton road, to which he was appointed only in December last. Mr. Griscom was for a long time Superintendent of the Eastern Division of the Pittsburgh, Fort Wayne & Chicago, and left that road less than two years ago to take charge of the Pittsburgh, Chartiers and Youghiogheny. In March, 1882, he was appointed General Manager of the Chicago & Western Indiana, and in December left that road for the Cincinnati, Hamilton & Dayton, from which he now returns to the Pittsburgh, Chartiers & Youghiogheny.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Six months ending June 30:

	1883.	1882.	Inc. or Dec.	P. c.
Atch., Top. & Santa Fe	$6,630,964	$6,831,869	D. $200,935	2.9
Bur., Cedar Rap. & No.	1,280,935	1,291,400	D. 10,545	0.8
Canadian Pacific	2,206,450	893,46	I. 1,312,904	146.8
Central Iowa	577,825	546,151	I. 31,674	5.8
Chesapeake & Ohio	1,799 539	1,399,118	I. 400,421	28.6
Chicago & Alton	3,774,978	3,434,115	I. 340,863	9.9
Chi. & Eastern Illinois	787,071	812,358	D. 25,287	3.1
Chi. & Grand Trunk	1,39 ,177	1,008,076	I. 382,101	37.9
Chi., Milwaukee & St. P.	10,690,000	9,200,229	I. 1,480,771	16.1
Chi. & Northwestern	10,805,232	10,615,205	I. 190,027	1.8
Chi., St. P., Min. & Oma.	2,327,431	2,223,558	I. 98,875	4.4
Cin., N. O. & Texas Pac	1,153,619	1,175,100	D. 21,481	1.9
Det., Lan. & Northern	728,090	770,763	D. 42,673	5.5
East Tenn., Va. & Ga.	1,780,149	1,397,777	I. 382,372	27.3
Flint & Pere Marquette	1,258,657	1,047,151	I. 211,506	20.2
Florida Transit	250,478	209,077	I. 41,401	19.8
Hannibal & St. Joseph	1,166,882	942,56	I. 224,322	23.7
Ill. Central, Ill. lines	3,080,712	3,170,348	D. 89,636	2.7
Iowa lines	941,443	913,962	I. 27,481	3.0
Southern Div	1,961,549	1,556,246	I. 405,243	26.0
Ind., Bloom. & Western	1,378,509	1,15 ,749	I. 227,760	19.8
Little Rock & Ft. Smith	246,843	194,019	I. 52,824	27.2
Little Rock, Mis. R. & Tex.	180,359	116,024	I. 64,335	55.4
Long Island	1,079,960	978,552	I. 101,408	10.3
Louisville & Nashville	6,5 7,129	5,808,128	I. 529,001	9.1
Memphis & Charleston	583,504	402,629	I. 70,875	14.4
Missouri Pacific Lines:				
Central Branch	672,396	382,311	I. 290,085	76.3
Int. & Gt. Northern	1,767,387	1,490,908	I. 276,179	18.5
Mo., Kan. & Texas	3,317,432	2,647,326	I. 670,106	25.3
Mo. Pacific	4,172,860	3,215,580	I. 957,280	29.9
St. L., Iron Mt. & So.	3,478,400	3,231,303	I. 247,097	7.7
Texas & Pacific	2,836,554	2,133,188	I. 703,366	33.0
Mobile & Ohio	965,379	878,948	I. 86,431	9.8
N. Y. & N. England	1,635,588	1,532,483	I. 93,115	6.0
Northern Pacific	3,475,758	2,659,316	I. 816,442	30.7
Ohio Central	486,798	455,986	I. 30,812	6.7
Ohio Southern	192,755	169,992	I. 22,763	13.4
Oregon Ry. & Nav. Co.	2,298,050	2,293,972	I. 4,078	0.2
St. P. & Duluth	525,224	420,504	I. 104,720	25.4
St. P., Minn. & Man.	3,912,511	3,631,034	I. 281,477	7.8
Tol., Cin. & St. Louis	405 436	352,738	I. 52,698	14.9
Five months ending May 31:				
Cin., Wash. & Baltimore	$716,343	$597,905	I. $118,438	19.8
Cleve., Col., Cin. & Ind.	1,545,307	1,500,183	I. 45,124	3.0
Grand Trunk	£1,409,624	£1,271,546	I. £138,078	10.9
Net earnings	361,578	272,171	I. 89,407	33.1
Month of April:				
Ohio & Mississippi	$337,084	$315,528	I. $21,556	6.9
Month of May:				
Cin., Wash. & Baltimore	$133,859	$126,995	I. $12,864	10.6
Cleve., Col., Cin. & Ind.	324,719	326,411	D. 1,692	0.5
Ohio & Mississippi	349,418	315,340	I. 34,078	10.8
St. John & Maine	15, 53	15,670	D. 617	3.9
Net earnings	3,844	5,587	D. 1,753	31.3
Month of June:				
Atchison, Topeka & S. Fe	$1,103,000	$1,148,000	D. $45,000	3 9
Bur., Cedar Rap. & No.	216,615	211,256	I. 5,359	2.5
Canadian Pacific	568,918	244,731	I. 324,217	132.8
Central Iowa	93,535	100,629	D. 7,094	7.1
Chesapeake & Ohio	325,525	271,381	I. 54,144	19.9
Chicago & Alton	653,-30	617,250	I. 36,280	5.9
Chi. & Eastern Illinois	143,215	132,601	I. 10,614	8.0
Chi., Mil. & St. Paul	2,023,000	1,691,430	I. 331,570	19.6
Chicago & Northwestern	2,175,325	2,043,475	I. 131,850	6.5
Chi., St. P., Minn. & O.	428,359	374,588	I. 53,771	14.3
Cin., N. O. & Tex. Pacific	2 6,371	183,568	I. 22,803	12.5
Detroit, Lansing & No.	131,293	134,175	D. 2,883	2.1
East Tenn., Va. & Ga.	26 ,864	208,387	I. 52,477	25.2
Flint & Pere Marquette	206,320	155,224	I. 5 ,096	32.9
Florida Transit	43,232	28,644	I. 14,588	51.7
Hannibal & St. Joseph	165,245	155,097	I. 10,148	6.6
Illinois Central, Ill. lines	534,174	504,159	I. 30,015	5 9
Iowa lines	166,221	148,185	I. 18,036	12.2
Southern Div	234,713	206,516	I. 28,197	13.6
Ind., Bloom. & Western	217,573	186,143	I. 31,430	16.9
Little Rock & Ft. Smith	28,881	26,763	I. 2,118	8.0
Little R'k, Miss. R. & Tex.	22,274	17,701	I. 5,573	28.4
Long Island	286,665	256,701	I. 29,964	11.7
Louisville & Nashville	1,169,800	902,719	I. 267,081	22.9
Memphis & Charleston	78,583	65,740	I. 12,793	19.4
Mo. Pacific lines:				
Central Branch	102,661	55,529	I. 47,132	84.2
Int. & Great No	270,508	261,754	I. 8,834	3.4
Mo., Kan. & Texas	556,331	455,944	I. 100,427	22.0
Missouri Pacific	636,7 6	535,689	I. 101,037	18.8
St. L., Iron Mt. & So.	554,559	530,701	I. 24,858	4.7
Texas & Pacific	4 6,226	397,253	I. 58,973	14 6
Mobile & Ohio	124,640	136,183	D. 11,543	8.5
N. Y. & N. England	293,919	285,391	I. 8,528	3.0
Northern Pacific	7 4,415	705,218	I. 49,197	7.0
Ohio Central	90,197	82,695	I. 7,432	9.0
Ohio Southern	28,1 3	25,778	I. 2,405	9.2
Oregon Ry. & Nav. Co.	415,850	399,268	I. 16,582	4.1
Net earnings	198,350	185,315	I. 13,035	7.0
St. Paul & Duluth	125,517	89,605	I. 35,912	39.9
St. P., Minn. & Man.	763,806	856,418	D. 92,612	10.8
Toledo, Cin. & St. L	90,000	67,647	I. 22,353	32.9
First week in July:				
Chi. & Alton	$146,848	$143,243	I. $3,505	2.4
Chi., Mil. & St. P.	425,000	331,340	I. 92,660	28.0
Chi. & Northwestern	456,300	419,0 0	I. 37,300	8.9
Chi., St. P., Minn. & Om.	81,100	75,300	I. 5,800	7.9
Denver & Rio Grande	147,600	112,800	I. 34,800	30.4
Mil. Lake Shore & West.	18,350	16,420	I. 1,930	11.7
Northern Pacific	188,700	156,725	I. 31,975	20.4
St. L. & San Francisco	55,400	54,500	I. 900	1.6

Grain Movement.

For the week ending June 30, receipts and shipments on grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

Year.	North-western receipts.	—Northwestern shipments.— Total.	By rail.	P.c. by rail.	Atlantic receipts.
1877	1,939,151	2,416,415	557,394	23.1	2,060,484
1878	3,006,566	3,059,500	826,301	27.0	3,662,715
1879	3,779,676	3,829,431	1,236,651	32.3	3,457,237
1880	5,117,800	6,025,682	1,709,241	28.4	8,192,047
1881	7,649,571	6,259,673	2,542,753	40.6	7,169,106
1882	2,310,613	2,481,797	727,259	29.3	2,939,877
1883	3,604,292	3,467.851	1,027,074	29.6	3,091,392

Thus the receipts of the week at the Northwestern markets this year were 1,294,000 bushels (56 per cent.) more than in the corresponding week of last year, but were 4,045,000 bushels *less* than in 1881, 1,513,000 less than in 1880, and a little less than in 1879. They were also 672,000 bushels less than in the previous week of this year, and the smallest for five weeks.

The shipments of these markets were 986,000 bushels more than last year, but 2,792,000 less than in 1881, and 2,558,000 less than in 1880. They were also 455,000 bushels less than in the preceding week of this year, and were the smallest for seven weeks. The rail shipments were larger than last year, but with that exception the smallest since 1878, and the smallest of any week since July 15th, 1882. The shipments down the Mississippi amounted to 52,500 bushels, or 15 per cent. of the whole.

The receipts of the Atlantic ports for the week this year were 752,000 bushels more than last year, but 3,478,000 less than in 1881, and 4,501,000 less than in 1880. They were a trifle less than the week before, and the smallest for seven weeks, but the variations since May have been but small.

While there was a decrease, compared with the previous week, of 672,000 bushels in the total Northwestern receipts, at Chicago the decrease was 418,800, and at St. Louis 191,900, and there were gains at Toledo and Peoria.

In Atlantic receipts, there being a decrease of but 37,000 bushels in the total, New York lost 748,000, while Montreal gained 351,000, and Philadelphia 280,000. Montreal's receipts were the largest of the year, and larger than in any week but one last year.

Exports from Atlantic ports for the week ending June 30, have been:

	1880.	1881.	1882.	1883.
Flour, bbls	90,218	104,782	105,001	135,181
Grain, bu	7,376,803	4,358,466	1,327,192	2,595,451

Including flour, the exports this year were 1,403,000 bushels more than last year, but 1,620,000 less than in 1881 and 4,580,000 less than in 1880.

San Francisco exports for the California crop year ending June 30 were as follows, flour in barrels and wheat in bushels, flour being reduced to wheat in the totals:

	1882-83.	1881-82.	Inc. or Dec.	P.c.
Flour	1,055,067	854,207	I. 200,860	23.5
Wheat	24,286,292	36,706,788	D. 12,420,496	33.8
Total, bushels	29,561,627	40,977,823	D. 11,416,196	27.9

Exports of California barley by sea for the crop year ending June 30, were 222,033 centals, against 92,416 centals for the previous year, an increase of 129,617 centals, or 140.2 per cent. Shipments of barley east by rail for the 11 months ending May 31, were 18,256 centals.

Coal.

Anthracite coal tonnages for the six months ending June 30 are reported as follows, the tonnage in each case being only that originating on the line to which it is credited:

	1883.	1882.	Inc. or Dec.	P.c.
Phila & Reading	3,234,452	2,922,568	I. 311,884	10.7
Northern Central, Shamokin Div. & Summit Branch	659,098	546,017	I. 113,081	20.7
Sunbury, Hazleton & Wilkesbarre	67,355	68,646	D. 1,291	1.9
North & West Br'nch	248,424	... .	I. 248,424	...
Penn. Canal	160,652	173,287	D. 12,635	7.3
Central of N. J.	2,283,785	2,089,619	I. 194,166	9.3
Lehigh Valley	2,804,159	2,683,322	I. 120.837	4.5
Penn. & N. Y.	97,392	95,184	I. 2,208	2.3
Del., Lack. & West.	2,219,023	2,014,921	I. 204,102	10.1
Del. & Hudson Canal Co.	1,768,555	1,539,120	I. 229,435	14.8
Penn. Coal Co.	623,921	581,205	I. 42,716	7.4
State Line & Sul'v'n	29,927	27,070	I. 2,857	10.6
Total anthracite	14,196,743	12,740,959	I. 1,455,784	11.4

The North and West Branch road was not opened at this time last year.

The anthracite coal tonnage for the corresponding period for eight years has been as follows:

1883	14,196,743	1879	12,033,998
1882	12,749,929	1878	7,212,665
1881	12,577,685	1877	9,915,120
1880	10,321,876	1876	7,165,324

The anthracite tonnage thus far this year is the largest on record. The increase for the half year over 1882 is 11.4 per cent.; over 1881 it is 12.9 per cent., and over 1880 it is 37.5 per cent. As compared with 1876, the worst year of the eight, the increase is 98.1 per cent.

Semi-bituminous tonnages for the six months ending June 30 are given as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Cumberland, all lines	1,095,837	530,260	I. 565,577	106.7
Huntingdon & Broad Top.	97,025	134,581	D. 36,956	27.4
East Broad Top	22,640	46,041	D. 23,401	50.9
Tyrone & Clearfield	1,369,710	1,443,497	D. 73,785	5.1
Bellefonte & Snow Shoe	121,177	105,931	I. 15,246	14.4
Total semi-bituminous	2,706.989	2,260,310	I. 446,678	19.8

The great increase shown in Cumberland shipments is due to the strike which stopped production so long last year. The reduction in Clearfield is due to the same cause, the scarcity of Cumberland last year opening new markets for the Clearfield coal.

Bituminous tonnages reported for the six months are as follows:

	1883.	1882.	Inc. or Dec.	P.c.
Barclay R.R. & Coal Co.	158,668	190,438	D. 31,770	16.7
Allegh'ny Region, Pa. R.R.	223,765	267,942	D. 44,177	16.5
Penn. and Westmoreland	680,272	640,103	I. 40,169	6.3
West Penna. R. R	224,427	178,522	I. 45,905	26.0
Southwest Penna. R. R.	54,602	30,805	I. 23,797	76.7
Pittsb'gh Region, Pa. R.R.	251,095	356,181	D. 105,086	29.5
Total bituminous	1,592,829	1,663,991	D. 71,162	4.3

The bituminous trade shows many changes and a small general decrease, probably due to a lighter demand from the iron trade. The reports of tonnage do not include a large part of the Pennsylvania bituminous output, and have nothing west of that state.

Coke tonnages reported for the six months are as follows:

	1883.	1882.	Inc. or Dec.	P.c.
Bellefonte & Snow Shoe	10,362	12,217	D. 1,855	1.5
Allegh'ny Region, Pa. R. R	49,903	56,131	D. 6,238	11.1
Penn and Westmoreland	114,194	131,909	D. 17,715	13.4
West Penn. R. R	53,083	61,919	D. 8,836	14.2
Southwest Penn. R. R.	1,011,704	911,241	I. 100,553	11.0
Connellsville R. Pittsburgh R. } Pa. R.R	306,718	333,920	D. 27,202	7 9
Total coke	1,546,054	1,507,337	I. 38,717	2.6

These tonnages are all over the Pennsylvania Railroad and its branches. The proposed arrangement to restrict coke production and increase prices has not been successful so far

The coal tonnage of the Pennsylvania Railroad Division, Pennsylvania Railroad, for the six months ending June 30, was:

	Line of Road.	From other Roads.	Total
Anthracite	315,879	750,092	1,065,971
Semi-bituminous	1,490,927	300,433	1,791,360
Bituminous	1,434,171	3,444	1,437,615
Coke	1,239,790	306,264	1,546,054
Total	4,480,767	1,360,233	5,841,000
Total, six months 1882			5,521,161
Increase (5.8 per cent.)			319,839

For the month of June (four weeks) the tonnage was: Coal, 648,316; coke, 233,941; total, 882,257 tons, against 859,433 tons in June, 1882, an increase of 22,824 tons, or 2.7 per cent.

Actual tonnage passing over the Pennsylvania & New York road for the seven months of its fiscal year from Dec. 1 to June 30 was:

	1883.	1882.	Inc. or Dec.	P.c.
Anthracite	640,536	591,846	I. 48,690	8.2
Bituminous	191,513	226,780	D. 35,267	15.5
Total	832,049	818,626	I. 13,423	1.6

The anthracite is received chiefly from the Lehigh Valley Railroad.

Actual tonnage passing over the Huntingdon & Broad Top road for the six months ending June 30 was as follows:

	1883.	1882.	Inc. or Dec.	P.c.
Broad Top coal	97,025	134,581	D. 36,956	27.4
Cumberland coal	225,947	85,331	I. 140,616	164.8
Total	323,572	219,912	I. 103,660	47.1

The Broad Top coal is mined on the line; the Cumberland

is carried through from Mt. Dallas to Huntingdon for the Pennsylvania Railroad Co. The Cumberland tonnage last year was very light on account of the strike.

Shipments of coal out of the Kanawha River Region in West Virginia in the year 1882 are given as follows: By rail, 265,266 tons; by river, 385,148; total, 650,414 tons.

Regular shipments from the Pocahontas mines in the Flat Top Region are now made over the Norfolk & Western road.

Cumberland coal tonnage for the week ending July 7 was 54,709 tons. The total shipments this year up to July 7 were 1,150,546 tons.

Chicago coal receipts for the two months from May 1 to June 30 were as follows:

	—Anthracite.—		—Bituminous.—	
	1883.	1882.	1883.	1882.
By lake	268,172	154,042	58,102	37,919
By rail	32,140	46,003	389,849	335,769
Total	298,312	200,045	447,951	373,688
Per cent. by rail	10.8	23.0	87.0	89.5

The total increase in anthracite was 98,267 tons, or 49.1 per cent.; the increase in bituminous was 74,263 tons, or 19.9 per cent.

The Denver *Republican* reports the production of the Rocky Mountain coal regions for the first half of 1883 as follows: Wyoming, 328,161; Colorado, 669,687; New Mexico, 117,745; total, 1,115,593 tons. The Colorado product includes 74,208 tons of coke.

Land Grant Sales.

The Kansas Pacific Land Department reports sales of 152,100 acres in the first half of this year, against 105,900 last year, an increase of 46,200 acres, or 43½ per cent. Most of the buyers, it is said, will make stock and dairy farms.

The Northern Pacific sold in June:

	1883.	1882.	Increase.	P. c.
Acres	97,651	71,760	25,891	36.0
Amount	$442,832	$231,201	$211,631	91.5

The average price was $4.54 per acre this year, against $3.22 last. There were besides sales of town lots to the amount of $11,612 this, which is $464 less than last year.

The Union Pacific in June sold land as follows:

	1883.	1882.	Increase.	P. c.
Acres	119,677	36,657	83,020	226.5
Amount	$485,376	$169,298	$316,168	187.3

The average price was $4.06 this year and $4.62 last.

For the fiscal year ending with June this company's sales were:

	1882-83.	1881-82.	Increase.	P. c.
Acres sold	761,261	465,208	296,053	63.6
Amount	$3,052,048	$1,674,749	$1,377,299	82.1
Town lots	330,771	34,588	296,183	856.0
Total amount	$3,383,019	$1,709,337	$1,673,482	98.0

These land sales alone are equal to 8 per cent. on the preferred stock, but those east of the Missouri are paid for in preferred stock, and in 1881-82 these amounted to $1,035,692. They were probably not so large a proportion of the whole as last year.

South Carolina Commission Rates.

A meeting was held in Columbia, S. C., July 5, at which representatives of nearly all the railroads in the state were present. There was a general discussion over the new rates ordered by the South Carolina Railroad Commission. A committee was appointed to confer with the Commissioners. The only result of the meeting was an agreement by the Commissioners to extend for 30 days the time for hearing claims for the exemption from the standard rates. The conference was entirely a friendly one.

Saginaw Lumber Shipments.

Shipments from East Saginaw and Bay City for June and the six months ending with June are reported as follows, in *thousands* of feet:

June:	1883.	1882.	Increase.	P. c.
East Saginaw	37,263	34,239	3,024	8.8
Bay City	87,792	74,127	13,665	18.4
Total	125,055	108,366	16,689	15.4
Six months:				
Both	357,513	287,795	69,718	24.2

There has been a good deal of complaint this year of unsatisfactory business, but it seems that there has been a very large increase in the shipments. Lower prices and not smaller sales have probably caused the complaints.

Northern Pacific Through Rates.

Mr. Muir, General Traffic Manager, in an interview, at Portland, Oregon, said, that the first-class passenger fare between St. Paul and Portland, 1,916, miles will be $100, the same as the rate between Omaha or Kansas City and San Francisco. Pullman sleeping-cars will run through, and dining-cars will be attached, and reclining-chair cars. The emigrant rate will be $45. The local rate will not be the same as the through rate for a long distance east of the Pacific, as is the case on the roads to San Francisco, but a little less—to Walla-Walla and the rapidly growing agricultural country in Eastern Oregon and Washington $97.50 first class and $42.50 emigrant.

It is not intended in any case to make the freight rate to local points equal to the rate to Portland plus the rate from Portland back to the local station, as has been done to some extent on the Central Pacific. Rates from Portland east and rates from St. Paul west will be the same to Bozeman and Missoula, and all stations on the 245 miles between these places.

Marketing Green Bay Lumber by Rail.

Heretofore the bulk of the lumber manufactured on the west shore of Green Bay has been shipped by lake to Chicago and distributed thence, little going by rail unless destined to South Wisconsin. Recently arrangements have been made for shipping directly to the West by the Chicago & Northwestern Railway by the chief mills at Menominee and Marinette. The rate thence to Missouri River points has been made the same as from Wausau, and 8 cents per 100 lbs. more than from Chicago, making a difference of about $2 per 1,000 ft. But the lake freight from Menominee to Chicago is $1.75, and its cost about $1 for handling in Chicago. This will enable these mills to secure a larger share of the Western orders, and it will give the railroad a long haul on a traffic of which, if it went by way of Chicago, it would get but a part.

Differential Fares.

The following circular has been issued by Mr. S. F. Pierson, Vice-Chairman of the Joint Executive Committee:

"The differential fares have been established, taking effect June 16, 1883, at Boston, Albany, New York, Philadelphia, Baltimore and Washington for all points in the territory beyond Chicago, St. Louis and the Chicago & St. Louis line of the Chicago & Alton Railroad as far south as and including the line of the St. Louis & San Fancisco and the Atchison, Topeka & Santa Fé railroad. Having reference to the following rule adopted by the Joint Executive Committee Aug. 26, 1882, viz.: 'No commission shall be paid on business from differential fare points to any other differential fare or intermediate points,' and having further reference to articles 10 and 11 of the contract entered upon April 27, 1883, all lines represented upon the Joint Executive Committee, and lines situated in the territory of that Committee working in harmony with them, are required to refrain from the payment of commissions or tickets sold in said Eastern cities on and after June 16, 1883, and which are destined to any point in the Western territory described."

Special Contracts on Pacific Coast Freight.

In the matter of the complaint of Richards & Harrison against the Central Pacific Railroad Co., that they had been charged extortionate rates on shipments of freight from Milwaukee to San Francisco, because they refused to make a special contract, including an agreement not to make any shipments by water, the California Railroad Commission has refused the relief asked by complainants for two reasons: First, because the complaint, properly considered, involves questions of inter-state commerce, and also extends really to a number of companies which are not under the jurisdiction of the Commission. Second, because the complainants have failed to prove that the charges complained of or the proportion of the charges received by the Central Pacific road are extortionate. The charges are below the maximum allowed in the state by law, and cannot be legally considered extortionate.

This decision does not prejudice the right of complainants to seek a remedy through the courts.

Chicago Traffic Notes.

Dining cars were put on the Chicago-St. Paul trains of the Chicago, Milwaukee & St. Paul Railway July 9.——The Rock Island road instructs its station agents to bill freight in car-loads, which is to be transferred to its eastern connections to the junction points just south of Chicago, instead of to Chicago, to avoid delays in the crowded Chicago yards. Freight in any quantity, as well as car-loads, for the Lake Shore and the Fort Wayne roads will be billed to Englewood; for the Chicago, St. Louis & Pittsburgh to Washington Heights; for the Chicago & Grand Trunk to Blue Island; for the Cincinnati, Indianapolis, St. Louis & Chicago to Seneca; car-load freight for the Baltimore & Ohio and the Nickel Plate to South Chicago; but quantities less than car-loads for these roads go to Chicago as does all perishable freight except that in Union Line refrigerator cars, which, like other Fort Wayne freight, goes to Englewood. Freight in whatever quantity for the Michigan Central and the Chicago & Atlantic goes to Chicago.——The Grand Army of the Republic get round trip rate from Chicago to Denver and return, for their great meeting in the last week of this month, for $29 80. The distance by the shortest route is 1,044 miles. The Milwaukee & St. Paul first made this low rate, which was contrary to the agreement of the other lines which have pooled their passenger traffic.——Samuel Osterman & Co. and E. F. Dexter, ticket scalpers, have been arrested on complaint of the Milwaukee & St. Paul, knowingly receiving stolen 1,000-mile tickets and passes. They gave bail.

Crop Prospects.

The Department of Agriculture reports for July 1, that the condition of the winter wheat crop had improved since June 1 from an average of 75 to 79, making the prospect July for a crop of fully 300 million bushels, against 387 millions last year. Spring wheat in the same time improved from 98 to 100, making a prospect for 125 million bushels, against 117 last year. This made a prospect July 1 for 425 millions of bushels of wheat, which is 79 millions less than last year. At that date there was time for but little improvement in winter wheat, except in Michigan and Northern Ohio, but it was liable to damage from bad weather. By this time, except in the district named, it must have been mostly harvested, and without injury from bad weather. Spring wheat then had time for either considerable improvement or very great damage. For the first 10 days of July the weather seems to have been generally favorable, except in a limited but important part of Dakota and Minnesota, including the Red River Valley, where the wheat suffered greatly from drought, but was revived by rain about the 8th. The best weather hereafter, may, perhaps, add 8 millions to the prospect of July 1, but very bad weather everywhere may reduce it 25 millions or more. The chances of injury are greater than those of improvement at this date, as the stand is more established.

A report from California says that the wheat crop has suffered greatly from three days of the hot north winds which are almost the only danger this crop has to meet if the winter and spring rains have been sufficient. The San Francisco *Chronicle* reports the damage as equal to a reduction of the yield from 10 to 25 per cent. in different counties. But the acreage is so much larger than last year that the crop is probably somewhat larger. Such reports of injury are likely to be exaggerated. The crop of barley, which in California takes the place of both corn and oats to a great extent, promises to be most excellent. Last year California produced 2,790,000 bushels of corn, 1,543,000 of oats and 9,131,000 of barley—insignificant amounts of corn and oats compared with the production of other states or with its own production of wheat, which was 36,046,000 bushels; while its barley production was larger than that of any other state.

The Iowa State Agricultural Society estimates the yield per acre of winter wheat at 90 per cent. of last year's; of spring wheat the same as last year. Very little winter wheat is raised in Iowa. The average, spring and winter, is about 2 per cent. less than last year, when the production was 25,487,000 bushels. An increased acreage and a slightly better condition of oats is reported, compared with last year, when the production was 52,618,000 bushels in Iowa.

The Department of Agriculture reports a general improvement of cotton during the month of June, bringing it up from 86 to 90. In the several states the condition reported is: Virginia, 88; North and South Carolina, 91; Georgia, 93; Florida, 95; Alabama, 87; Mississippi, 89; Louisiana, 91; Texas, 93; Arkansas, 84; Tennessee, 88.

The Department of Agriculture reports 68 millions of acres planted with corn July 1, which is 2½ millions (3.8 per cent.) more than last year. The average condition it gives as 88, against 85 last year. The improvement in both is equal to about 113 million bushels. The weather since July has been generally favorable.

Colorado Traffic Association.

At a meeting held in Chicago, July 11, the members were unable to come to any agreement as to the percentage of business to be allotted to each, and an adjournment was had until Aug. 6, when the Arbitrator, Mr. J. F. Tucker, is expected to make his report. The existing division continues in force until that time.

Chicago Live-Stock Pool.

The Chicago, St. Louis & Pittsburgh Co. has renewed its demand for a share in the Chicago east-bound pool on live-stock traffic. The company asks 15 per cent. It has heretofore been included with the Pennsylvania Company in this pool.

OLD AND NEW ROADS.

Anniston & Atlantic.—The line of this road, as now located, is from Anniston, Ala., the crossing of the East Tennessee, Virginia & Georgia, and the Georgia Pacific, by way of Coldwater Springs, Alabama Furnace, Mumford, the Clifton ore bank, Talladega and Winterboro to Goodwater, the terminus of the Columbus & Western road. It will be of 3 ft. gauge and about 50 miles long, running through a country rich in iron ore, coal and lumber. There are also, it is said, valuable beds of marble and other building stones on the line.

Atlantic Highlands & New York.—The track on this road is all laid, and it will be opened for business July 15. It extends from Atlantic Highlands, N. J., a summer resort on the sea shore, north of Long Branch, westward to a junction with the New Jersey Southern, near Red Bank. It is about 5 miles long, and will be worked as a branch of the New York & Long Branch road.

Atlantic & Pacific.—The opening of this road as a through line to California has been delayed by the partial destruction of the bridge over the Colorado River by a freshet. The high water not only washed away part of the bridge which was finished, but also carried off part of the material for its completion, which was piled up on the banks. No date has been set for the opening of the road, because it is still uncertain when the bridge will be ready.

Augusta & Knoxville.—At a meeting of the board in Augusta, Ga., July 4, it was stated that the earnings show a large increase over last year. No provision was made for the payment of the coupons which came due on July 1. It is said that some arrangement for their payment will soon be made.

Baltimore & Ohio.—Surveys are being made for a cross-cut or loop from the main line at Easton, in Marshall County, W. Va., to the Pittsburgh Division, at or near Layton, Pa. The line crosses the Monongahela River, at Greenfield, Pa., and is about 60 miles long.

It is said that a branch is to be built from the Newark, Somerset & Straitsville Division, at Shawnee Run, O., up Rock Run, to a point not far from New Straitsville. This branch will be about 3½ miles long, and will reach several new coal mines.

The Baltimore *Sun* of July 10 says: "The Baltimore & Ohio has about completed its terminal improvements and branch railroad at Curtis Bay, near Baltimore, and several industrial enterprises are proposed at that point. The construction of car-shops is one of these, for which a capital of $300,000 is required. Of this $150,000 is said to be secured, including $50,000 subscribed by Mr. Robert Garrett. The Baltimore & Ohio Co. offers to start the works with an order for 2,000 cars for its service. Among other rumors afloat is one to the effect that a sugar refinery is proposed, in which English capital will be embarked if the enterprise is thought to warrant the risk.

"Since Mr. John W. Garrett has been abroad intelligence has come to hand that a German syndicate has become interested in the Atlantic cable, about which there was a good deal of discussion last year. It is intimated that Mr. Garrett's visit to Europe this summer was partly in connection with this cable business.

"The chiefs of the operating departments of the railroad are experimenting with a view of adapting the locomotives to the pattern of the one of the Reading Co., which was recently given a trial on the Main Stem and Washington Branch. The principal feature is a change in the fire-box, by which smoke and cinders are consumed.

"The Baltimore & Ohio has become pretty well known as one of the cheapest commuting roads in the country for residents living near Baltimore. The policy intended by this is to build up residences along the line, especially between Baltimore and Mt. Airy. The good effects of this action are beginning to be seen. It is a departure in the right direction, and if a schedule of trains is adopted which experience proves will meet the proper wants of the public, local traffic will become a more important feature than it has ever been. It is said that the local business is to be carefully looked after on the Philadelphia Branch upon its completion."

Bellaire, Zanesville & Cincinnati.—On the extension of this road from Woodsfield, O., to Zanesville, work is progressing steadily. The headings of the tunnel at Perryopolis are through, and the tunnel will be ready for the track this month. On the St. Clair tunnel near Cumberland work is being pushed day and night. On the western end the track is now laid to Duncan's Falls, 10 miles, and a train has been put on. On the eastern end the rails are laid to Danford, 7 miles beyond the late terminus at Louisville and 15 miles from Woodsfield. Surveys are to be made for a branch from Caldwell southwest to Beverly, on the Muskingum River.

Boston & Maine.—This company will rebuild temporarily its round-house and workshops on the site at Prison Point, Charlestown, where they were burned last week. The subject of permanently establishing the workshops on land owned by the company near Oak Grove, Malden, is being considered.

Buena Vista Branch.—Arrangements are being made to build this road from Buena Vista in Marion County, Ga., northward to Bostick, on the Southwestern road. The Central Railroad Co. agrees to furnish iron and equipment, taking its pay in stock and bonds, provided the people on the line will grade the road. The distance is about 22 miles.

Canadian Pacific.—A temporary wooden bridge (to be shortly replaced by iron) 1,000 ft. long has been built across the Saskatchewan River, and tracklaying is progressing rapidly from the present terminus at Medicine Hat westward. The present rapid rate of progress will be continued for about 200 miles, when the road will reach the base of the Rocky Mountains, and some heavy work will be encountered.

Cape Cod Ship Canal.—A new company has been organized to build the ship canal across the narrow neck at the western end of Cape Cod, which has been talked about for so many years. It is claimed that the new company has sufficient capital to carry the work through without trouble. By the terms of the charter it must deposit $200,000 with the state as security, and must make a substantial beginning of work within four months.

Caraquet.—This company has secured subsidies of $15,000 from the Dominion government in addition to a provincial subsidy of $3,000 per mile, and work will be begun at once. It will run from Bathurst, N. B., on the Intercolonial, along the shore of Chaleur Bay through Clifton, Grand Anse and Caraquet to Shippegan, a distance of 45 miles.

Carolina Central.—It is reported that this company is considering the question of extending its road from the present terminus at Shelby, N. C., west to Rutherfordton, about 25 miles; also of building a line from Shelby northward through Morganton to Cranberry, in Mitchell County, a distance of about 75 miles.

Catskill Mountains.—This road is this year running trains to Palenville, N. Y., 2 miles beyond last year's terminus at Mountain House station, and 16 miles from the Hudson River terminus at Catskill Landing.

Central, of New Jersey.—At a conference between President Gowen and the committee representing the income bondholders, held in New York, July 10, it was agreed that the income bonds shall be exchanged for new 6 per cent. debentures, having 25 years to run, and convertible into stock after July 1, 1885. The debentures are to be issued for an amount equal to the face of the income bonds and the 10½ per cent. previously agreed on as an allowance for back interest; that is, $1,105 in debenture bonds will be exchanged for each $1,000 income bonds. This will avoid the issue of scrip for the back interest as at first proposed.

A special meeting was held in Jersey City, July 6, to vote on the final ratification of the lease of the road to the Philadelphia & Reading Co. Mr. F. A. Comly presided, and most of the voting was done on proxies, the opposition entering a formal protest against the admission of any proxy which did not contain a specific authorization to vote in favor of the lease. This protest was not regarded. Nearly 155,000 of the 185,632 shares were voted, of which 150,828 shares were in favor of the ratification and 4,124 against it. There were a large number of proxies. The Reading people voted about 30,000 shares. Mr. Garrett of the Baltimore & Ohio voted 4,000 shares; Sidney Sheppard of Buffalo, one of the directors of the Jersey Central, voted 7,000 shares; E. C. Knight, 7,500 shares; A. P. Morgan, 5,000 shares; Vice-President John Kean, 2,350 shares; T. H. Taylor & Co., 3,765 shares; President Little, 325 shares, and Spencer, Lark & Co., 3,029 shares. Of the opposition vote. 2,000 shares were held by Mr. Dinsmore of the Adams Express Company, and 2,000 shares by the Stephen Vail estate.

In the United States Circuit Court in Trenton, N. J., July 11, leave was granted to Edward T. Greer, of counsel for the Pennsylvania Railroad Company, to file a stipulation providing that Wm. B. Dinsmore's motion for a preliminary injunction to annul the lease of the New Jersey Central road to the Philadelphia & Reading Co., should go over without detriment to either party in the suit to the fourth Tuesday of September. The stipulation was signed by Clarence Seward for the Pennsylvania and by ex-Chancellor Williamson for the Philadelphia & Reading. The matter of the New York & Long Branch Railroad superintendency goes over to the same time.

Some complaint is made by the people on the line of the Lake Hopatcong Branch and the Ogden Mine road that no passenger trains are run over those branches. The Ogden Mine road's business was entirely in iron ore, but when it was transferred to the Central and connected with its High Bridge Branch, it was understood that passenger trains would be run. The passenger traffic to the Ogden Mine is small, but at this season there are a good many people going to Lake Hopatcong, and the people interested think that they should have some consideration; at least a passenger car might be attached to the ore train and run on a regular time-table for their accommodation.

Central Pacific.—The passenger trainmen of this road have been put in uniform, the style adopted being thus described by the San Francisco *Evening Post:* "The uniform cloth is navy blue. In summer, employés on the Southern Pacific may substitute blue flannel suits. Caps will be of the same color, railroad style, bell-crowned, flat top, cloth or leather visor, with a small 'C. P.' button at each side. The caps of conductors will have a band an inch and a quarter wide, with gilt braid of suitable width at the top and bottom of the band. Other men will have a gilt braid at the centre of the band. Conductors, baggagemen and passenger-train brakemen will wear on the front of the cap metal or gilt embroidered badges, designating the position of the wearer. Freight-train brakemen will not have any uniform. The uniforms of baggagemasters, passenger-train brakemen and freight conductors will be exactly alike, except that the conductor's cap will be different, or like that of a passenger conductor."

Chesapeake & Ohio.—This company makes the following statement for the five months ending May 31:

	1883.	1882.	Increase.	P.c.
Earnings	$1,473,014	$1,127,737	$345,277	30.6
Expenses	1,051,338	873,918	177,420	20.3
Net earnings	$421,676	253,819	167,857	66.1

This company has completed arrangements for a direct line of steamships between Newport News and Liverpool. It is said that the company will endeavor to secure a share of the immigrant travel by this route.

Chester & Lenoir.—Track on this road is now completed to Newton, N. C., 12 miles northward from the late terminus at Mayden, and 84 miles from the southern terminus at Chester, S. C. From Newton to Hickory, 10 miles, the track of the Western North Carolina road will be used, a third rail being laid. From Hickory northwest to Lenoir, about 18 miles, the line is all graded and tracklaying will soon be begun.

Chicago, Burlington & Quincy.—This company's statement for May and the five months ending May 31, as corrected (the former statement was partly estimated), is as follows:

	May.		Five months.	
	1883.	1882.	1883.	1882.
Earnings	$2,009,872	$1,505,261	$9,467,287	$7,718,451
Expenses	1,128,116	857,494	5,030,328	4,344,061
Net earn'gs.	$881,756	$647,767	$4,436,959	$3,374,390

For the five months there was an increase of $1,748,836, or 22.7 per cent., in gross earnings; an increase of $686,267, or 15.8 per cent., in expenses, and an increase of $1,062,569, or 31.5 per cent., in net earnings.

Chicago Belt.—The Chicago *Tribune* says: "The directors of the Chicago Belt-Line Railroad Co. have reduced the capital stock of the company to $200,000. The Belt-Line was first incorporated as the Western Indiana Belt-Line with a capital stock of $12,000,000. Only about $2,000,000 of that amount was paid up, which sum was expended in the construction of the line, which is now completed from South Chicago to a connection with the Chicago, Burlington & Quincy, and crossing nearly all the roads centering in this city. About six months ago the Western Indiana Belt-Line Co. leased the road to the Chicago Belt-Line Railroad Co. for 999 years at a fixed rental of $130,000 per annum. It was then decided to invite the various railroad companies entering in this city to purchase stock in the company, and thus become part owners, and Mr. Robert Harris, one of the directors, and General Manager James Walsh, were lately appointed a committee to call upon the general managers of the various roads for the purpose of interesting them in the enterprise. They found, however, that most of the managers were averse to joining the company, because the impression got abroad that the affair was a great speculation, and that the road was too heavily encumbered to become profitable. To remove this impression it was decided to reduce the capital stock to $200,000. With the proper support from the various railroads in this city, there can be no doubt of the company's ability to earn the fixed rental of $130,000 per annum and a handsome dividend on the capital stock of $200,000. It is understood that the new arrangement is satisfactory to most of the roads which are intersected by the Western Indiana Belt-Line, and that they will now take some of its stock and give it their business."

Chicago & Northwestern.—The Sac City Branch is now completed to Correctionville, Ia., 11 miles westward from the late terminus at Holstein and 55 miles from the junction with the Maple River line at Wall Lake. Surveys have been made for an extension from Correctionville northwest to Quorn, 14 miles.

On the Eagle Grove & Sioux Rapids line track has been laid from Hawarden, Ia., westward to Centreville, Dak., 25 miles. At the northern terminus of this branch work was begun some time ago, and track has been laid from Iroquois, Dak., on the Pierre line, southward 14 miles. The gap remaining to be filled is 87 miles.

Cincinnati & Eastern.—The track is now laid to Ottawa in Scioto County, O., 4 miles beyond the late terminus at Rarden and 87 miles from Cincinnati. About 19 miles remain to reach Portsmouth, which is nearly all graded.

At the recent annual meeting an issue of $2,000,000 consolidated bonds was authorized, of which $1,000,000 will be used to build the extension to Gallipolis.

Consolidated Railroad Co., of Vermont.—A hearing was had last week in Boston on the question of dissolving a temporary injunction restraining this company and the American Loan & Trust Co. from issuing $1,000,000 bonds for the purchase of the stock of the Vermont & Canada Co. The temporary injunction was granted in a suit brought by Mr. Hazard, a Vermont & Canada stockholder, whose bill charges that the whole transaction is illegal and *ultra vires* as regards both companies. The case was argued at some length on both sides, and the Court reserved its decision, which has not been announced up to date.

It is intimated that this suit may be settled by the purchase of Mr. Hazard's stock by parties who are interested in closing up the matter. The only obstacle remaining to the completion of reorganization will then be the suit brought by Mr. John N. A. Griswold on equipment bonds owned by him. It is said that this suit also may be settled by the purchase of Mr. Griswold's bonds.

Florida Land Grants.—A correspondent of the New York *Times* asserts that the Florida Legislature has made grants of land to existing and projected roads which, in the aggregate, considerably exceed the quanty of land at the disposal of the state. Should all, or the greater part, of the projected lines be built, some of them will have to put up with a good deal of very poor or worthless land, while others will be unable to secure any at all, in spite of their grants and charters.

Fort Wayne, Goshen, Elkhart & South Bend.—This company has been organized to build a road from Fort Wayne, Ind., northwest through Goshen, Elkhart and South Bend to Niles, Mich., about 90 miles. It is intended to be a branch of a projected line from Fostoria, O., to Burlington, Ia., and Peoria.

Fort Wayne & Indianapolis.—This company has been organized to build a railroad on the most direct possible line from Fort Wayne, Ind., southwest to Indianapolis, about 110 miles. It is intended as a branch of a projected line from Fostoria, O., to Peoria and Burlington.

Georgia Pacific.—The track on this road is now laid continuously from Atlanta, Ga., westward to the Coosa River in Alabama, 127 miles, and from Birmingham, Ala., eastward 13 miles, leaving 28 miles to be laid to complete the line from Atlanta to Birmingham. On the gap of 28 miles all the grading is done, the only work remaining to be finished being the bridge over the Coosa River and a tunnel 12 miles west of that point, on both of which good progress has been made.

Green Bay, Winona & St. Paul.—A reported sale of this road to the Chicago & Northwestern is denied by the parties in interest. A similar report has been circulated several times before.

Greenwood, Laurens & Spartanburg.—The stockholders have voted to authorize the issue of $700,000 bonds, to be secured by first mortgage on the road. The road is to run from Greenwood, S. C., northward through Laurens to Spartanburg, 66 miles, and considerable work has been done on the grading.

Gulf, Colorado & Santa Fe.—This company has let contracts for 10 new locomotives and 300 box cars to accommodate the increasing freight traffic.

Hannibal & St. Joseph.—All the stock of this company has been transferred to the Chicago, Burlington & Quincy Co., except about 4,000 shares of common and 3,500 shares of preferred stock, held in small lots, the owners of which have not presented them for purchase.

Harrisburg & Western.—It is stated that all the capital stock of this company has been subscribed, Wm. H. Vanderbilt taking $5,000,000, Dr. Hostetter, who represents the Economite Society, of Pittsburgh, $2,000,000, Mr. Vanderbilt's sons about $1,000,000 more and parties interested in the Reading road a considerable amount. Pending the completion of the organization, a managing committee has been appointed, consisting of Dr. Hostetter, H. McK. Twombly, Wm. K. Vanderbilt, Franklin B. Gowen and W. C. Whitney.

Illinois Central.—This company's statement for June shows earnings from traffic for that month as follows:

	1883.	1882.	Increase.	P. c.
In Illinois	$534,174	$504,159	$30,015	6.0
In Iowa	166,221	148,185	18,036	12.2
Southern Division	234,713	206,516	28,197	13.6
Total	$935,108	$858,860	$76,248	8.9

The Land Department reports for June, 1883, sales of 3,193 acres of land for $13,569, and cash collections amounting to $12,144 on land accounts.

Kaaterskill.—This road has been completed and opened for business. It is intended chiefly for summer travel, and extends from Tannersville Junction, N. Y., on the Stony Clove & Catskill Mountains road, to the Hotel Kaaterskill, a distance of 8 miles.

Kentucky Central.—Connection having been completed with the Richmond Branch (which this company leases from the Louisville & Nashville, with privilege of purchase), the 34 miles of the branch were changed from 5 ft. to standard gauge on Sunday, July 1.

Litchfield, Carrolton & Western.—The track is now laid on this road and trains are running from Carrolton, Ill., on the Chicago & Alton, eastward to Greenfield, on the Chicago, Burlington & Quincy's St. Louis Division, a distance of 12 miles. Work is in progress on extensions from Carrolton west to the Illinois River, about 10 miles, and from Greenfield southeast to Litchfield, about 33 miles.

Louisville, New Orleans & Texas.—Tracklaying on this road, which is the consolidated line down the east side of the Mississippi from Memphis to New Orleans, has been begun from Memphis, Tenn., southward. From New Orleans northward the rails are reported laid for 45 miles, with the grading finished to Baton Rouge, 92 miles. From Baton Rouge north to Port Gibson, 117 miles, about one-third of the grading is done. From Port Gibson to Vicksburg, 28 miles, the track is laid. Track is also reported laid from Yazoo Crossing northward 20 miles. The whole distance from Memphis to New Orleans by the line as located is 452 miles.

At the Yazoo Crossing work on the bridge has been temporarily stopped by high water. The same cause has delayed work at the crossings of the Homochitto, Big Black and Sunflower rivers, where there is some heavy and troublesome work. In fact, the river crossings will be the most expensive part of the road.

Maryland Central.—Track is laid to Belair, Md., the county seat of Harford County, and trains will begin running to the new terminus about July 15. Belair is 6 miles beyond the late terminus at Fallston and 29 miles from the Baltimore terminus of the road,

Massachusetts Central.—The Boston *Advertiser* says: "The bonds of the Massachusetts Central Railroad Co. are still being received by the New England Trust Co., the time for their deposit having been extended to Aug. 1. The work of reorganization is going forward in a quiet way, and it is probable that the new corporation will be successfully organized early in the fall, and work resumed soon thereafter."

Mt. Mitchell.—A company has been organized to build a narrow-gauge line from Round Knob, N. C., on the Western North Carolina road, to the summit of Mt. Mitchell. Surveys are now being made, and it is believed that a practicable route can be found to a point very near the summit.

New Hampshire General Railroad Law.—A dispatch from Concord, N. H., July 10, says: "Representatives' Hall was well filled to-night to attend the hearing on the Colby railroad bill. Hon. James W. Emery of Portsmouth made a long address against the bill, which he claimed would not be beneficial in helping the construction of the new railroad, and would result in increased freight and passenger tariffs, with a practical loss to the state of its present control over roads within its boundaries. He appeared for various manufacturing corporations in Portsmouth and Manchester. Mr. S. B. Page of this city made a speech against railroad monopoly in this state, which he asserted the Colby bill would give, in opposition to the interests of the people. The hearing will be continued each evening this week. The Hon. J. Gregory Smith, President of the Central Vermont Railroad, is in town to-night consulting with President Sherburne, of the Northern Railroad, relative to the position which the Central Vermont will assume in the present controversy. The latter road will not consent to any plan which contemplates any refusal to extend the charter of the Forest Line Railroad, by which the Central hopes to have another southern outlet from Windsor, Vt., to Wilton, N. H., there to connect with the Boston & Lowell road."

New York & Atlantic.—The New York Supreme Court has put this company into the hands of a receiver. The company last year built about half a mile of track, from the foot of Thirty-sixth street, in Brooklyn, N. Y., to a junction with the Brooklyn, Bath & Coney Island road, but no trains have ever been run over it.

New York, Pennsylvania & Ohio.—The London agency announces that hereafter the reports of earnings will be made monthly by the middle of the second month following that in which they are made, and that there will be no weekly reports. The settlements with the Erie for rental will be half-yearly, up to the end of March and September. Thus the first settlement will be for a period of five months only. Thus the New York, Pennsylvania & Ohio has the profits of the first four months of the year only to meet the July interest on the prior lien and the first-mortgage bonds. These net earnings were:

January.	February.	March.	April.	Total.
$46,735	$20,597	$105,474	$125,129	$297,935

This is $197,400 (192 per cent.) more than in the corresponding period of last year. Of this $160,000 goes for interest on the prior lien and $35,000 for additions to the property; the balance of $102,935 is not 27 cents per $100 on the 7 per cent. first-mortgage bonds, and no cash is paid therefore, but the coupons are redeemed in scrip convertible into more first-mortgage bonds, thus adding $1,342,985 to this issue, making it $39,713,985.

New York, Texas & Mexican.—Work will soon be begun on the extension of this road from Victoria, Tex., toward Brownsville.

New York, West Shore & Buffalo.—The following notice is issued from the General Passenger Agent's Office:

"This line will be opened for passenger business between New York and Albany on July 9, 1883, *via* Haverstraw, West Point, Cornwall, Newburg, Highland (opposite Poughkeepsie), Kingston, Saugerties and Catskill. Connections will be made at Union Station, Albany, with trains on Delaware & Hudson Canal Co. Railroad for Saratoga, Lake George, Lake Champlain, Adirondacks, Montreal and all points north. Connection will be made at Union Station, Jersey City, with trains on the Pennsylvania Railroad for Philadelphia, Baltimore, Washington and all points south.

"Pullman's parlor and buffet cars will be attached to all express trains.

"New York passengers will arrive and depart *via* Desbrosses street and Cortland street ferries. Brooklyn passengers will arrive at and depart from the foot of Fulton street, *via* Brooklyn Annex ferry.

Of the progress of the work on the road west of Syracuse, the Rochester *Union and Advertiser* says: "Rapid progress is being made upon the West Shore in Erie and Genesee counties. In Genesee County the grading is entirely completed on the Tonawanda Indian Reservation, and at Tonawanda Creek they are now building the last abutment. The erection of the iron bridge at that point will begin on the 15th inst., by which time the bridge-builders will have finished their labors at Elcott. The grading from the creek down to the State road will be finished by Aug. 1. There is a heavy cut in the town of Alabama, 6 miles east of Akron, where the work of removing the soil is prosecuted day and night. So far 50,000 yards of earth have been taken out and the remaining 30,000 yards will disappear by the middle of August, as the men are working from both ends. The grading will then begin and be prosecuted with vigor. East of Alabama the grading through the country is finished, with the exception of about two weeks' filling at the town line of Oakfield and Elba. Near this point the contractors are making good headway. The cuts at Alabama and Elba and the fill on the Todd farm at Byron are the key to the

whole division, and before they are finished all other grading and the masonry will have been completed. In Erie County tracklaying will begin at Walden Avenue on the southwest, as the cut at that place will then be out, and the iron will be carried forward as far as Akron, a distance of 20 miles. Tracks will be laid also from Akron to Alabama, a distance of 6 miles, and while waiting for the cut at Alabama to be completed the road will be ballasted between the points named. The tracklayers will in the meanwhile work west from Churchville to the Todd farm and from Fairport to Churchville."

Northern Pacific.—On the branch to the Yellowstone National Park the grading is now completed from Livingston, Mon., to the boundary of the park, and tracklaying has been begun. It is expected that the rails will be down to the park borders early in August. They are now reported down for 5 miles southward from Livingston.

Sealed proposals will be received at the office of Chief Engineer A. Anderson, in Brainerd, Minn., until July 21 for clearing, grading and bridging the extension of the leased St. Paul & Northern Pacific road from Sauk Rapids, Minn., to Minneapolis, about 65 miles. Maps, profiles, etc., can be seen, and blank forms of proposal obtained at the office in Brainerd, or at the office of J. W. Kendrick, Resident Engineer, in Minneapolis.

Oregon Improvement Co.—This company makes the following statement for May and the six months of its fiscal year from Dec. 1 to May 31 :

	May—		Six months.
	1883.	1882.	1883.
Earnings	$374,636	$267,339	$1,756,000
Expenses	230,385	178,347	1,251,158
Net earnings	$144,301	$88,992	$504,842

For May the statement shows an increase of $107,347, or 40.2 per cent., in the gross earnings; an increase of $52 038, or 29.2 per cent., in expenses, and an increase of $55,309, or 62.1 per cent., in net earnings.

Last December this company determined to issue $2.000,000 of new capital, $1,500,000 to be used to extinguish the floating debt of the company, and $500,000 to remain as an asset in the treasury. In accordance with the terms of the bondholders' mortgage, the right to subscribe to this new stock at par was offered to them. As the stock was in the market at considerably below par, the bondholders did not avail themselves of the subscription privilege. In January, the right to subscribe to this new stock was offered to the stockholders upon the same terms with a like result. Recently, the Boston *Transcript* says, the entire $2,000,000 of new stock has been sold, mostly to Boston investors. It was marketed very quietly in the latter half of June at within 1 per cent. of the market price, which has been 88 to 89 this week.

Oregon Railway & Navigation Co.—This company makes the following statement for June and the fiscal year ending June 30, the earnings for June of this year partly estimated :

	June.		Year.	
	1883.	1882.	1882-83.	1881-82.
Earnings	$415,850	$399,268	$5,074,759	$4,947,980
Expenses	217,500	213,953	2,602,353	2,544,866
Net earnings	$198,350	$185,315	$2,472,406	$2,403,114

For the year there was an increase of $126,779, or 2.5 per cent., in gross earnings; an increase of $57,487, or 2.3 per cent., in expenses, and an increase of $69,292, or 2.9 per cent., in net earnings. The corrected statement will probably increase the June earnings a little.

Pennsylvania.—Surveys have been made for a branch from this company's new Schuylkill Valley line through the Perkiomen Valley to a connection with the Lehigh Valley road at Allentown. The route surveyed comes up through the Swamp Creek Valley to the neighborhood of Dillingersville, and thence to near Emaus and on to Allentown. The plan contemplates the tunneling of the Lehigh Mountain, and the line, as it has been run, is upwards of three miles shorter than that of the Perkiomen Railroad. The idea is to form a junction with the Lehigh Valley road at Allentown, and to establish a depot in the up-town portion of the city.

The Court has refused the application of the Philadelphia & Reading Co. for a permanent injunction to prevent the laying of the tracks of the Pennsylvania Schuylkill Valley line through Lafayette street in Norristown and over land belonging to the Reading. The temporary injunction is continued until security is given for the payment of damages which may be awarded to the Reading Co. for the use of the land.

People's Railroad Co., of America.—Existing railroad companies must prepare to be crushed when this company gets fairly at work, for its projected lines cover the country pretty well, and will duplicate a good many of the present roads. The project looks very much as if it was the work of a "crank," or else of a shrewd swindler who expects to make something by getting subscriptions in small sums from ignorant people. The Indianapolis papers give the following summary of its articles of incorporation.

The object of the company, as stated in eight paragraphs, is:

"To organize a system to secure a uniformity in the manner of selling railway stocks and bonds, dividing them into denominations that will reach the capital of the producing public, for the building, equipping—or buying railroads now built—and forever owning in its corporate name, and maintaining, with necessary appurtenances thereto, a complete system of railroads, by the people and for the people of the United States of America.

"To establish fast emigrant, express and freight lines.

"To strictly prohibit Chinese or Mongolian employment in its various branches of labor.

"To provide such by-laws as are necessary for the complete government and management of the affairs of this company, as shall conform with the laws of the state of Indiana, or other states and the United States.

"To establish local boards for the handling of its stock and bonds, at such place or places, within or without this state, as may be authorized by a majority of the board of directors.

"To establish at least ten depositories for the safe keeping of its funds or other securities within or without this state or the United States.

"To establish reasonable salaries for its officers; provided that no officer shall receive a salary to exceed the sum of $10,000 per annum.

"To provide for a national syndicate, to be composed of not more than 250 members, to the stated sessions of which representatives may be admitted as provided for in the by-laws of this association."

According to the specifications, America will be covered with a network of railroads, extending from Indianapolis in all directions. The lines specified are as follows:

From Indianapolis to Chicago, a distance of about 220 miles.

From Indianapolis, in a southerly direction, to a point on the southern boundary line of the state of Indiana, opposite or near to the city of Louisville, a distance of about 110 miles.

From Indianapolis, thence in a westerly direction toward St. Louis, a distance of about 125 miles.

From Indianapolis in a northeasterly direction toward the city of Cleveland, to a point on the eastern boundary line, at or near where the dividing line between Mercer and Dark counties, Ohio, strikes the said boundary line; a distance of about 120 miles.

From Indianapolis to Cincinnati, to a point on the eastern boundary line, at or near the point which would be reached by a line 10 miles north of the Ohio River, a distance of about 120 miles. Beginning at the state line, forming a junction with the northern line first described running to Chicago, Ill., in Lake County, thence in an easterly direction toward the city of Cleveland, via Toledo, O., crossing at or near ten miles south of the northeast corner of the state of Indiana, a distance of about 175 miles.

Continuing the western lines across Illinois to or near St. Louis; thence across Missouri, to or near Kansas City; thence west across Kansas, Colorado, New Mexico, Arizona into California to Oakland, near the city of San Francisco, reaching Los Angeles by a branch line, with such other Western branches as may be found to be demanded and expedient in the judgment of the board of directors.

An eastern line, connecting at the northeast corner of Indiana to Toledo, across Ohio, with branches from Toledo to Detroit and Cleveland; thence to Buffalo, over Lake Erie, by steamer, or by a lake shore line, keeping about 20 miles distant from the lake on the south side; from Buffalo, thence across New York and Massachusetts to Boston.

At the northeastern boundary of Indiana, thence east to Boston across the states of Ohio, Pennsylvania, New York, New Jersey, Connecticut and Massachusetts, reaching Cleveland, Harrisburg, Philadelphia, New York and Boston.

Connecting with the Cincinnati Division from Cincinnati east, through the states of Ohio, West Virginia, Maryland, Pennsylvania to Philadelphia, via Charleston, Virginia, Washington and Baltimore.

From Louisville south across the states of Kentucky and Tennessee to Nashville; thence with two branches one to New Orleans, La., and the other to the Florida coast.

From New Orleans west, crossing Louisiana, Texas and New Mexico to a connecting point with the main western line.

From New Orleans in a northeasterly direction to Norfolk, Va.; thence up the Chesapeake Bay by steamer, or along the western shore by rail to Baltimore. Across the states of Mississippi, Alabama, Georgia, South Carolina and Virginia, with such other projections as may be found advantageous to this company.

It is provided that all lines designated above shall be considered only as temporarily claimed, and shall be subject to such changes as will be found advantageous in the final survey.

The capital stock is to be $175,000,000, and provision is made for the issue of bonds at the rate of $10,000 per mile.

Pittsburgh, Cleveland & Toledo.—Track is reported laid on this road from New Castle Junction, Pa., west to Carbon, 8 miles; also, from Akron, O., eastward to Kent, 11 miles. Work is progressing from Kent toward Youngstown.

Potomac, Fredericksburg & Piedmont.—This road last year carried 41,227 tons of freight, of which 34,894 tons were east-bound and 6,333 tons west-bound. The chief items of freight were 24,512 tons of lumber and 6,929 tons of cord-wood. The road extends from Fredericksburg, Va., to Orange, 38 miles.

Quebec & Lake St. John.—A contract for the construction of this road has been let to H. J. Beemer, who agrees to have the road completed to Lake Edward by the end of 1885, and to Lake St. John by the end of 1886. The road will run from Quebec north by east into a country a large part of which is now almost uninhabited.

Richmond & Alleghany.—The following circular has been issued by Lawrence Myers and Decatur Axtell, Receivers, dated Richmond, Va., June 30 : "Notice is hereby given to all whom it may concern that the property, works and franchises of the Richmond & Alleghany Railroad Co. were placed in the hands of the undersigned as Receivers of the Circuit Court of the City of Richmond, by a decree of that Court entered on the 23d day of June, 1883, and all persons are warned not to interfere in any manner with said property, works or franchises, except by our order, or the order of one of us, or of our agents."

Rome, Watertown & Ogdensburg.—This company has made an agreement to allow the Southern Central and the Lehigh Valley companies the use of its track between Sterling, N. Y., and Oswego, 14 miles, as noted elsewhere.

Rutland.—The irregularities in the accounts and the over-issue of stock by the late Treasurer have produced considerable feeling, and at the coming annual meeting an effort will be made to elect an entirely new board. There is considerable excitement among the Boston stockholders, and a free issue of circulars on both sides.

St. Croix.—This company has been organized to build a railroad from St. Croix Falls, Wis., to Woodville on the Chicago, St. Paul, Minneapolis & Omaha road, and thence to Chippewa Falls. The distance is about 90 miles.

St. Johns & Lake Eustis.—On the extension of this road from Fort Mason, Fla., the grading is completed to Tavares, and tracklaying will soon be begun.

St. Johns River.—This company has been organized to build a narrow-gauge railroad up the east bank of the St. Johns River from Jacksonville, Fla., to Enterprise, about 140 miles. The incorporators are S. B. Carter, C. C. Collins, Dennis Eagan and R. McLaughlin, all of Jacksonville.

Southern Central.—This company, which is controlled by the Lehigh Valley, has made an agreement securing the use of the Rome, Watertown & Ogdensburg's Lake Ontario Division for the 14 miles between Sterling, N.Y., the crossing of the two roads, and Oswego. Passenger and coal trains will be run to Oswego, and it is said that the Lehigh Valley Co. will build coal trestles and a shipping dock at that place. By this agreement the Southern Central secures a better coal port than Fair Haven, its present terminus on Lake Ontario, and the advantages of the considerable town of Oswego as a starting point for its passenger trains.

Tavares, Orlando & Atlantic.—Work has been begun on the grading of this road from Tavares, Fla., toward Orlando on the South Florida road.

Texas & St. Louis.—A dispatch from St. Louis, July 7, says: "Messrs. Rust & Coolidge, contractors for building the bridge across the Arkansas River for the Texas & St. Louis Railroad, served notice yesterday on President Paramore, at Pine Bluff, Ark., that they would abandon the bridge unless they were paid $25,000 cash, and were released from a penalty of $35,000 caused by the non-completion of contract. Col. Paramore refused their demand, entered suit against them for $35,000, and attached their machinery. The bridge is within two weeks of completion, and the work will proceed as soon as possible."

Thames River Bridge.—The government commission on the Thames River Bridge is again in session this week. The opponents of the bridge brought forward testimony to show that any bridge crossing the river from Groton, Conn., to New London would be a serious obstruction to a large commerce, while the New York, Providence & Boston and the New York, New Haven & Hartford companies produced evidence that the commerce of the river would not be seriously disturbed. The hearing is still in progress.

Toledo, Cincinnati & St. Louis.—The Boston *Advertiser* of July 9 says: "It is reported that the New York financial coterie known as the Seney syndicate, most famous for its management of the Nickel Plate deal, has recently made a purchase in Cincinnati of a large block of the bonds and stock of the Toledo, Cincinnati & St. Louis Railroad, and that this syndicate will shortly have a representation in the directory of the company. If the programme said to have been arranged is carried out, at least three of the present members of the board will retire in favor of gentlemen who will represent the Ohio Central, the Lake Erie & Western, and the Peoria, Decatur & Evansville roads. [This was done July 10.] The new element would bring capital and energy, both of which would be useful, without saying anything in disparagement of the present management of affairs. The road is paying operating expenses from earnings, and making improvements as fast as it can with the proceeds from the late subscriptions, but will need more money to develop its full capacity. Additional sidings are needed, and will be built in part with iron rails, for which 500 tons of steel, just received, are to be substituted. The company will shortly possess rolling stock sufficient to do a business of $150,000 per month, and it is hoped that this amount may be done in September."

The June earnings of the road are estimated at $90,000, against $83,000 in May—the damage done to the road by recent floods near East St. Louis. There are now 103 locomotives on the road, and 8 more will soon be delivered. All the earnings over working expenses are applied to ballasting and other improvements.

Troy & Greenfield.—During the month of June 5,345 freight cars were hauled over this road and through the Hoosac Tunnel. In June, 1882, the traffic moved was 4,293 cars, showing an increase this year of 1,052 cars, or 24.5 per cent.

Union Pacific.—Track on the Oregon Short Line is now laid to a point 67 miles west of Shoshone Junction, Idaho, making the end of the track 388 miles from the Union Pacific main line at Granger, and leaving about 136 miles to be completed.

Valley, of Virginia.—Tracklaying has been in progress for some time, and the rails have now reached Greenville, Va., 12½ miles south of the old terminus at Staunton, and 38½ miles from Harrisonburg. Work is progressing steadily toward Lexington.

Western & Atlantic.—The Augusta (Ga.) *Chronicle* says: "Among the subjects which will engage the attention of the Legislature at its present session, none is more important, not only to the parties immediately interested, but also to the public generally, than the pending litigation between the state and the lessees of the Western & Atlantic Railroad. We give a brief review of the course the case has run thus far in the courts and the Legislature.

"The proceeding is one of *quo warranto*. It seeks, speaking non-technically, to annul the lease, and return the control of the road to the state. The two main grounds (beside which really the others are of no moment) on which this proceeding is based are: 1. That the bond given by the lessees was invalid, because the railroad companies, which are sureties on the bond, had no legal right to become sureties, and are therefore not bound as such. 2. That a majority of the shares are held by non-residents of the state.

"The lessees have met this assault with determination. They deny the applicability to this case of the proceeding which the state has set in operation against them. They deny that the facts alleged by the state are legally sufficient to support the proceeding. They deny the existence of the facts themselves. Only preliminary questions have been passed upon by Judge Willis, the Superior Court judge who has thus far heard the case. He has decided all these questions adversely to the lessees. The legal profession, better than the *Chronicle and Constitutionalist*, can say whether these decisions have given satisfaction to the legal mind of the state or not. The case has also been to the Supreme Court of the state, not upon any of the questions affecting the merits of the controversy, but under the following circumstances: Judge Willis granted an appeal by the lessees to the Supreme Court, but still persisted in going on with the trial in the Superior Court. Thereupon the lessees applied to the Supreme Court for a prohibition restraining him from trying the case in his court until the appeal was disposed of by the Supreme Court. Upon that hearing the Supreme Court held that Judge Willis had committed the double error, first of granting the appeal at that stage of the case, and second, of undertaking to try the case in the Superior Court after he had thus sent it to the Supreme Court, and the latter Court sent the whole back to the Superior Court for a regular hearing.

"At this stage of the business the Legislature intervened as follows :

"At the last session a resolution was introduced by Mr. Brooks, of Floyd, looking to the dismissal of the case. This resolution was referred to the Judiciary Committee, but other business at the moment more urgent prevented the committee from reporting it back during the short November-December session. The Legislature, however, recognizing the fact that the fierce legal war, in which the pendency of the resolution had brought about an armistice, would on the adjournment be immediately resumed, if something were not done to avert it, passed an ancillary resolution as it were, requesting the Governor to arrange with the counsel of the lessees for a further truce until the Legislature, now just assembled, should have an opportunity of acting upon the original resolution. This is the present position of the business in the courts and before the Legislature. If the Legislature passes the resolution dismissing the case, of course there is an end of it. If, on the other hand, the Legislature defeats it by action or non-action, the armistice will be at an end, and the war will rage again."

Wheeling & Harrisburg.—This company has filed articles of incorporation in West Virginia to build a railroad from Wheeling eastward to a connection with the Harrisburg & Western road in Westmoreland County, Pa. It is intended to be a branch or extension to Wheeling of the Harrisburg & Western road.

Wisconsin, Iowa & Nebraska.—It is said that contracts will soon be let for the grading of this road from Marshalltown, Ia., to Des Moines.

Worcester & Shrewsbury.—This road has been sold to Mr. H. H. Bigelow, of Worcester, Mass., who will hereafter control it The road is a short suburban line, running from Worcester to Lake Quinsigamond, 3 miles.